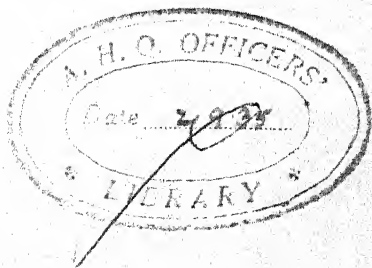


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GERMANY'S AIR FORCE

by

Otto Lehmann-Russbueldt

• WITH AN INTRODUCTION

by Wickham Steed

AND AN APPENDIX

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Dated	29-09-51
LONDON	

George Allen & Unwin Ltd
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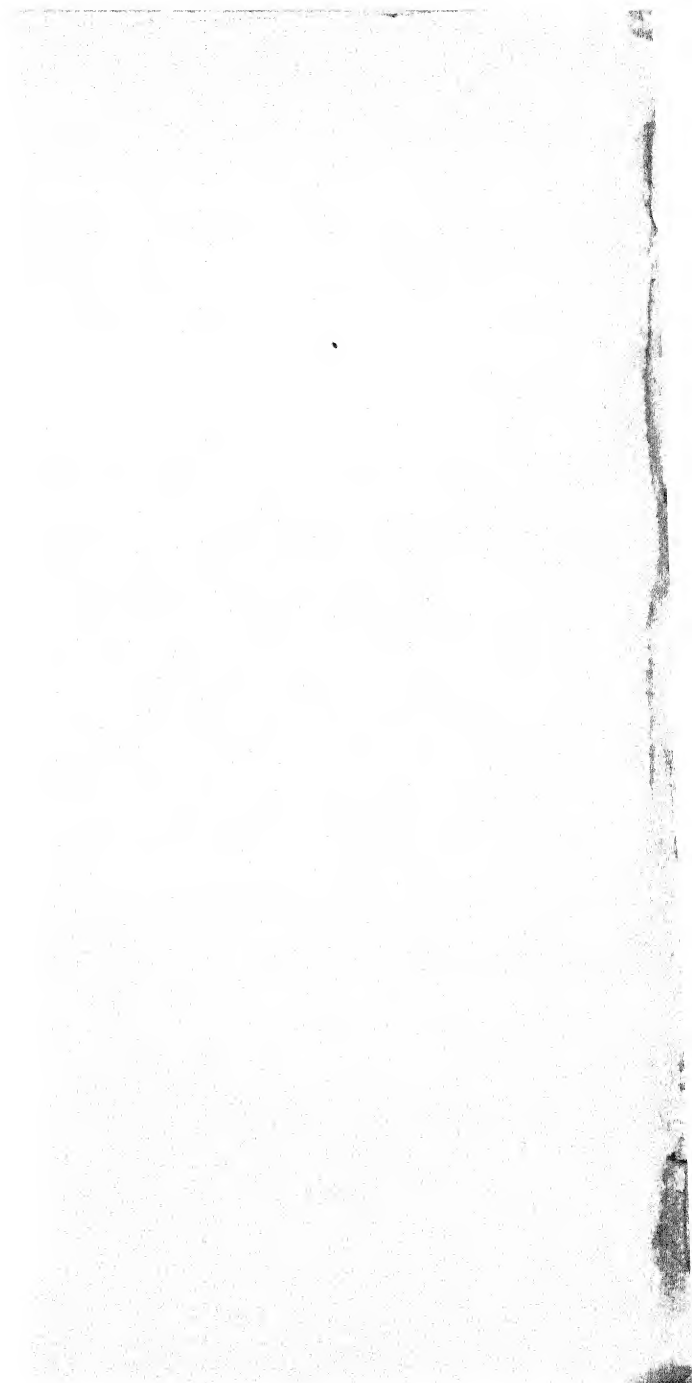
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INTRODUCTION

by WICKHAM STEED

It is no light matter to introduce and recommend this study of Germany's Air Force to readers of English. Did I not know its author to be a man of careful mind and good faith I should not do so, especially at a moment when the Anglo-French proposals for an International Air Convention and for the establishment of security in Europe are still under consideration. But the aim of those proposals is the progressive organization of non-war as a step towards peace: and something more than good intentions is needed to realize it. Knowledge and open-eyed recognition of essential facts are necessary. To such knowledge Herr Otto Lehmann-Russbueldt's analysis of the air force which Germany has built up, in deliberate contravention to the Peace Treaty, is a noteworthy contribution.

Since I first met him at Geneva in the autumn of 1926, on the eve of Germany's entry into the League of Nations, I have known him as a zealous and fearless worker for the rational and guaranteed disarmament of nations.

INI
In the German counterpart of the R.A.M.C., on more than one front during the war, he saw war in all its ugliness. He saw, too, its meaning for the common soldier and the common people. He came out of it with a hatred fierce and deep of all it implies—fiercest and deepest, maybe, towards those makers of armaments who profit by bloodshed and others' woe. Since then he has not grown weary in his efforts to enlighten his fellow-countrymen upon the things he knew—until, at length, his love of peace cost him his cherished status as a German citizen.

He was under no illusions about the resolve of Germany to rearm. At our first meeting I was struck by his doubts of Dr. Stresemann's sincerity, although that statesman was about to lead the first German Delegation into the League of Nations Assembly, after having negotiated the Locarno Settlement of October and December 1925. I, too, felt doubts, not so much of Dr. Stresemann's good faith or good will as of his understanding of the task that lay before him, if he were truly minded to bring Germany, as an equal partner, into a Europe organized for peace. A talk with Dr. Stresemann confirmed my misgivings; but it was not until the posthumous publication

of the first of the two volumes of his *Testament* revealed the spirit in which he had gone to Locarno and entered the League that I understood how much ground there had been for Herr Lehmann-Russbueldt's scepticism.

The course of events in Germany during the past few years has more than borne out his predictions; and if justification were needed for his earlier strictures upon "the Bloody International" of armaments firms, the recent Senate inquiry at Washington into their methods would supply it. In those strictures he did not mince his words or beat about the bush. He felt sure of his facts, and called things by their names. In his present work he may err on the side of under-statement, but his conclusions are not on that account less impressive. They amount, in effect, to an indictment of the German Governments which have persistently carried through the rearmament of their country while pretending that the shackles of the Versailles Treaty still held it in a position of unarmed inferiority to all its neighbours in Europe.

As I understand it, his case may be summed up in five main counts:

(1) Germany has systematically ignored and gone beyond the "equality" which was promised

her at Geneva on December 11, 1932, on condition that she should join in making provision for general security against war;

(2) Her rearmament is neither defensive nor preventive in character. Rather is it purely offensive, as appears from the swift development of her air force and its equipment with weapons of offence against the civil population of other countries;

(3) By this form of rearmament the spirit of the Kellogg Pact has been violated—a pact which Germany was the first to sign—since it renounces aggressive warfare and leaves no place for lawful offence; and Germany has likewise infringed the demilitarization of the Rhineland zone by setting up offensive military works within it;

(4) Even should Germany be held innocent of having done these things deliberately, and to have acted in the belief that her own safety was endangered, the nature and the extent of her rearmament shows her, in any event, to have gone beyond the framework of the MacDonald disarmament scheme of March 16, 1933, which she had accepted as the basis of a Disarmament Convention;

(5) Yet, in her process of rearmament, Germany can claim that she has been aided

and abetted by the armaments industries of various foreign countries, and in particular by those of Great Britain, France, the United States, Switzerland, Holland, and Sweden. They have all furthered the offensive rearmament of Germany by deliveries both of raw materials destined for the manufacture of armaments and of manufactured accessories such as aircraft motors. In this way these foreign armaments firms have wittingly acted against the defensive interests of their own countries and have helped to thwart the peace policies of their own Governments.

* * *

Though the pace of German rearmament, especially in the air, has been particularly swift since the advent of Herr Hitler's "Third Reich," it is important to remember that rearmament began long before he was appointed Chancellor on January 30, 1933. It was looked upon as a condition essential to an affirmation of German "equality," once the burden of reparations should have been got rid of. The German reparations debt having, to all intents and purposes, been cancelled at the Lausanne Conference in June 1932, and the chief aim of the campaign against Article 231—the legal

statement of claim for reparations, improperly called the "war-guilt" clause—of the Versailles Treaty having thus been attained, efforts could be concentrated upon rearmament. These efforts were the more successful because the campaign against the "war-guilt" clause had helped to engender an "inferiority complex" and sense of injustice, amounting almost to persecution mania, among the German people, and to foster their readiness to follow Herr Hitler as the champion of German freedom and equality.

If it is not surprising that successive German Governments should have sought to free themselves from the excessive and uneconomic burden of reparations which, under Article 231, France and other victorious countries had originally placed upon Germany, it is remarkable that Germany's creditors should have winked at the heavy German expenditure upon armaments which accompanied or followed every reduction of the German reparations debt. It was quite clear that, at a time when Germany was pleading poverty, and consequent inability to meet claims for reparations, she was spending vast sums abroad as well as at home upon military equipment and the purchase of war materials. No less clear was it that she was pursuing concurrently three

aims—liberation from reparations payments, release from the military clauses of the Versailles Treaty, and rearmament in a degree that would enable her to defy her former enemies should that release not be granted. The advent of Hitlerism was welcomed by her people both as an escape from their, largely self-engendered, "inferiority complex" and as a step towards the fulfilment of the programme of territorial expansion in Europe which Herr Hitler and his associates consistently advocated.

The birthday of the "Third Reich" is not so much January 30, 1933, when Herr Hitler became Chancellor, as March 23rd, when President von Hindenburg relinquished, in favour of the new Chancellor, his constitutional right to sanction legislation. Thus Herr Hitler virtually gained supreme power, and it was not astonishing that, as soon as he felt strong enough to put down his foot, he should have decided on October 14, 1933, to withdraw from the League of Nations rather than join in working out an International Disarmament Convention which would have made the armaments of Germany, like those of other countries, subject to inspection and control. Germany's withdrawal from Geneva was an act of defiance which might mean either that she

would go her own way, regardless of consequences, and attempt to bring the "Germanic" populations of neighbouring countries into one great German "folk-community" by propaganda and agitation, or that, under threat of attack by her powerful air force, she would seek to extort unconditional recognition of her "equality" with other countries.

Herr Lehmann-Russbueldt shows at what cost the German air force was developed, how the outlay was dissimulated, and, approximately, what degree of strength in the air Germany has now attained.

In any event, Germany undoubtedly possesses marked superiority in what is known as "war potentiality" or, in other words, fighting spirit, the convertibility of industry to war purposes, and preparedness for chemical and bacteriological warfare. In this respect the peculiar character of aircraft has to be borne in mind. An air force is essentially an offensive, or a counter-offensive, arm. It changes radically the older conceptions of national defence, that is to say, the protection of civilian lives and property. Against aerial attack no adequate means of defence have yet been found, nor is it certain that they can be found. Since the likeliest form of aerial warfare is sudden

attack, with the dual object of destroying military and industrial centres and of paralysing an enemy's power of resistance by spreading panic and working havoc in his big towns and cities, the chief safeguard against it is ability swiftly to take effective reprisals. Only by immediate success on a large scale could an aggressor hope to escape reprisals; and only by fear of overwhelming reprisals would a warlike country, which should believe itself strong enough to attack another country by air, be debarred from carrying out its purpose.

Air attack and reprisals by modern chemical—to say nothing of bacteriological—means would, however, cause damage so immense and widespread that Europe might be reduced to a heap of poisoned ruins. Therefore the question arises whether the leading nations of Europe and, indeed, of the world, ought not to band themselves together in such fashion as to make sure that no aggressor could hope to triumph, and to leave him only a prospect of sharing a fate that would be a *reductio ad absurdum* of civilization. In his study of this matter Herr Lehmann-Russbueldt reaches conclusions with which I heartily agree—that a system of collective security, based on superiority in the air, can alone afford protection against war; and

that such a system, under the League of Nations and the Kellogg Pact, postulates the antecedent renunciation of neutrality towards an aggressor on the part of those who uphold it. This principle of non-neutrality was accepted by the statesmen who drafted the League Covenant at the beginning of 1919; and though it was enfeebled by the decision of the United States not to join the League, it was again strengthened, at least by implication, when the Kellogg Pact for the renunciation of war was signed and ratified in 1928. In 1930 a British Parliamentary Paper, of which the Law Officers of the Crown had approved, expressly declared that, as between members of the League of Nations, neutrality cannot exist. And, apart from general principles, the efficacy of even an improvised system of collective security was twice demonstrated in the course of 1934. At the end of July 1934, after the murder of the Austrian Chancellor, Dr. Dollfuss, the Nazi attempt to gain control of Austria was defeated by an impressive display of collective opposition; and in the following autumn a similar firmness prevented the outbreak of hostilities between Yugoslavia and Hungary when the League Council dealt with the acute crisis that arose out of the Marseilles assassinations.

But it is not enough to rely upon improvisations. There is much force in Herr Lehmann-Russbueldt's contention that the existence of a German air force ought long since to have been brought before the Permanent Court of International Justice at The Hague. For reasons too numerous to examine, this was not done; and there is no certainty, or even likelihood, that it will be done in future. Suggestions have been made from time to time that an independent and impartial Council, or "Forum," of eminent representatives of the chief peace-loving countries in the world should be formed so as to bring public opinion to bear, and to throw the full light of publicity, upon military preparations that may be held to threaten the peace of the world. With these suggestions I have considerable sympathy, though I am not unaware of the practical difficulties that would stand in the way of their fulfilment. Besides, publicity to-day is no longer what it was, even before the Great War. Three great countries, at least, have now suppressed any publicity of which their rulers may not approve, and the force of public opinion—on which Mr. Stimson, Secretary of State in the Hoover Administration, laid so much stress in his weighty pronouncement upon neutrality

and the renunciation of war on August 8, 1932—has been correspondingly weakened. Still, the moral verdict of those parts of the world where information and opinion are still free might possess great, and possibly decisive, weight; and no Government which remembers the costly and unavailing efforts made by Germany during the Great War to dispel the odium which she brought upon herself by the invasion of Belgium would be wise to court the moral condemnation of the world again.

Pending some definite measures to establish collective security against war—and the application of the police principle, based on non-neutrality, against offenders—the menace of the German air force remains. The importance of Herr Lehmann-Russbueldt's little work, and of its contribution to the cause of peace and disarmament to which the greater part of his mature life has been devoted, is that it enables readers of average intelligence to perceive how serious this menace is and to ask themselves what should be done to meet it. They should ask this not alone for the sake of nations which may feel themselves menaced by a rearmed Germany, but also and especially for the sake of the German people themselves. For without the co-operation of a peaceful Germany, as

an equal, in a Europe organized against war, there can be no assured future for European civilization or certainty of well-being for Germany or her neighbours.

• WICKHAM STEED

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THE HISTORY OF THIS BOOK

It may be said that two minor incidents in the year 1934 were instrumental in bringing about a significant change in English politics.

On February 6, 1934, a Labour Member of Parliament, Mr. F. Seymour Cocks, laid a document before the House of Commons giving the secret building programme of the German military air fleet and showing how this fleet would be ready for use within three months. It is true that exact details of Germany's air force had already been published in some London papers, but practically no notice had been taken of them. Mr. Seymour Cocks's information first roused the particular interest of Sir Austen Chamberlain and Mr. Anthony Eden. Until then all statements about Germany's air force had been regarded as false, imaginary, or wildly exaggerated. The change in England dates from Mr. Winston Churchill's speech of March 8, 1934, when he pointed to this now open air-rearmament as a serious menace to England and to the whole world.

The articles and the secret documents about Germany's air force quoted by Mr. Seymour Cocks were obtained through Dr. Dora Fabian.

She was a German refugee who was imprisoned when Hitler came to power in Germany because she had been the editress of the pacifist paper *Das Andere Deutschland* (*The Other Germany*). The publisher of this paper, Fritz Küster, has been in prison for two years. Dr. Dora Fabian, who was released after ten days, came to England. As a result of her publications and the attention which had been aroused by Mr. Seymour Cocks's statement, Nazi spies broke into Dr. Dora Fabian's flat about the middle of February 1934, to find out to what extent she was responsible for these revelations.

General Goering's secret aircraft programme which was exposed in the House of Commons on February 6, 1934, was published in Miss Dorothy Woodman's book *Hitler Rearms* in the autumn of 1934.

The second incident that considerably strengthened the change in English politics was the publication of an article by Mr. Wickham Steed on July 1, 1934, in the *Nineteenth Century and After*. This article is reprinted in the appendix to this book. It quotes documents which give proof of systematic preparation of the German air force for a new attack. Mr. Wickham Steed's publication was at first received sceptically. But four days later, on

July 4th, Mr. Baldwin made clear in an answer to a parliamentary question that the English Government did not wish to dispute the authenticity of the documents.

The results of this were clearly shown on July 30th, when Mr. Baldwin spoke the now famous phrase about "England's frontier being on the Rhine." Exactly twenty years earlier Sir Edward Grey had hesitated so long without making any clear statement that Germany, hoping for England's neutrality, declared war on Russia and France and attacked Belgium. Twenty years later England's declaration came clearly enough and in time to destroy any National Socialist hope of risking an attack in the Rhine zone.

I then decided to describe in this book about Germany's air force the influence that Germany's unhealthy war spirit is having on the German people and on the rest of Europe. My book is an analysis of the war spirit in Germany and not an accusation against the German people. For all countries are to blame for the desperately serious situation in Europe at the present time.

The mere announcement of this book brought further Nazi police action against me. On April 21, 1935 (Easter Sunday), a German spy pretending to be an official from the political

department of Scotland Yard tried to gain entrance into my room to "confiscate" certain papers. I was away, but a friend prevented the spy from carrying out his intention. Nothing of use to him would have been found. Fear of the activities of German emigrants is part of the insanity of the Nazi régime. All the dangers to this régime lie in itself.

It is a very great pleasure to me to thank all the friends who have helped me with the preparation of this little book. Of these friends I can at the moment only mention the name of Dr. Dora Fabian, who died tragically on March 31st with her friend Mathilde Wurm.

OTTO LEHMANN-RUSSBUELDT

GERMANY'S AIR FORCE

CHAPTER I

THE THREE MAIN AIMS OF NATIONAL SOCIALISM

THE unrestricted control of Germany by National Socialism dates from March 21 and March 23, 1933. On those two days the Reichstag was in session, first in the Garrison Church in Potsdam and then in a Berlin theatre, and absolute control over the State was handed over to Herr Hitler. Reichspresident von Hindenburg made no use of his constitutional right to raise objection to the laws proposed, and so allowed the executive and the legislative power to be concentrated in Hitler's hands.

The first of the great aims of National Socialism had already been realized before Hitler came into power. In June 1932, the so-called "national movement" had succeeded at Lausanne in freeing Germany from the payment of "reparations," or what other lands called Germany's war debts. The Weimar Republic had inspired such confidence in the debtors

that they were willing gradually to waive their claims to payment, and Herr von Papen reaped the benefit of that confidence in the summer of 1932. Germany did not pay her debts, and the ancient *furor teutonicus*, an object of fear since the days of Tacitus, and now masquerading under the name of National Socialism, could proceed to fulfil the second of its chief aims—the rearmament of Germany.

Herr von Papen, successful at Lausanne, became merely a pace-maker for Hitler, despite antagonisms which at times were sharp. Thus, too, it was with his successor, General von Schleicher, to whom “equality” in the military sphere was formally conceded at Geneva on December 11, 1932.

At that time the Reichspresident was still the embodiment and source of political and administrative power in Germany. Twice, in August and in November 1932, Hindenburg had refused to admit the claim of the Austrian adventurer Hitler to the chancellorship, though Hitler was the leader of the strongest party in Germany. But, in January 1933, the intrigues of von Papen succeeded in producing a situation in which Hindenburg, hitherto regarded as the “saviour,” had to turn for his own salvation to Hitler. Hitler did not conquer power; Hinden-

burg surrendered it to him because he feared the threat of "agrarian Bolshevism," as the lord of Neudeck called the expropriation of the great East Elbian landlords, much more than he feared Hitler's "Bolshevism." Hindenburg rudely dismissed Bruening, and let Papen go with a sigh, before he entrusted the destinies of Germany to a man whom he as a Field-Marshal needed only to call "Corporal" Hitler.

This evolution can only be understood in the light of the "national idea." To that idea the leading personalities of the country adhered, but they gave it a peculiarly Prussian colouring, that is to say, the thought of power founded upon militarism with the aim of revenge after a lost world war. The first great success of this movement, of which the influence unfortunately was always underestimated abroad, was the election of Hindenburg to the presidency in 1925. In so far as the man who lost the war had influence, he used it to strengthen the ascendancy of militarism. Even under the chancellorship of the Socialist Hermann Mueller that evolution went on steadily. The navy bills and the four "pocket battleships" are proof enough.

But militarism longed not so much for warships as for aircraft. To conjure up a strong

air fleet out of nothing, under the shadow of the Versailles Treaty, was a masterpiece, and the masterpiece was achieved. Even the prelude thereto was a brilliant essay in dissimulation. This was Hitler's "four-year plan," announced on May 1, 1933, for the reconstruction of Germany after the alleged economic failure of all his predecessors, including the Imperial régime. In that plan there was not a word about military rearmament, not a word about the construction of an air fleet. But at the same time that Herr Hitler announced this plan, General Goering began building an aerial war fleet, the composition of which we shall explain later on.

The revelation of this construction programme in February 1934 in the British House of Commons passed almost unnoticed.

The statement of Mr. Baldwin, then Lord President of the Council, to the House of Commons during the debate on the Address on November 28, 1934, was in consequence all the more impressive. He revealed not merely to the British Empire but to the world the fact that a German air fleet was already in existence. He spoke of it as if it were something which had to be accepted, although as late as July 30, 1934—the date on which he coined

the memorable phrase about Britain's frontier being on the Rhine—he had treated it as negligible quantity, but yet had justified the increase of the British air fleet by forty-one squadrons with reference to this fleet which diplomatically had no existence. On that same day Mr. Winston Churchill, with that directness which is his peculiar characteristic, asked the Government whether it was true that the German air power was now two-thirds of the British. Sir John Simon, the Foreign Minister, answered testily that no one knew better than Mr. Churchill that a Government could not tell everything that it knew.

But on November 28th, that is, only four months later, the Government by the mouth of Mr. Baldwin, committed itself to an arithmetical statement and declared that the German air strength was one of 600 to 1,000 war machines.¹ Its *exact* strength Mr. Baldwin did not know. The only consolation that he could offer was that, in the time at their disposal, the pilots could not yet be fully trained. "This is a subject," he said, "which has engaged the earnest attention of the Government . . . a

¹ *Parliamentary Debates*, House of Commons, vol. 295, No. 7, November 28, 1934. The "Friends of Europe" have reprinted the speeches of Mr. Baldwin and Mr. Churchill in their pamphlet No. 19.

subject that touched not only ourselves and our defences but the whole of Europe." This was his answer in the debate on Mr. Churchill's amendment to the Address, ". . . that in the present circumstances of the world the strength of our national defences and especially of our air defences is no longer adequate to secure the peace, safety, and freedom of your Majesty's faithful subjects." Mr. Baldwin thus looked not merely to the peace and security of England but to the welfare of Europe, and that no one might be left in doubt whom he considered to be the threat to the peace of Europe, he turned to Germany with the words: "I do hope that when statesmen in Germany read this debate they will do me the honour of reading every word of what I am going to say and judge it by its general sense and in the spirit, and not by the picking out of words."

Further speeches followed—from every quarter. Germany thereby gained the most important factor, time, to increase her air force, which she did in almost geometric proportion to the time gained. The "i"s were only dotted and the "t"s crossed when at the beginning of March 1935 General Goering introduced himself officially as "Air Force General" to the foreign military attachés in Berlin and

spoke about "My Air Force" the size of which varied from zero to infinity.

For many years I, and a few others, have been trying to draw the world's attention to the great danger which threatens from the militarist Germany, whose present air fleet has become "Public Enemy No. 1" to European peace. Because we felt ourselves to be Europeans in the Baldwinian sense we are to-day exiles from Germany and expatriated. I most emphatically called attention to the danger inherent in the situation upon which we were entering in a pamphlet called *Die Reichswehr*¹ which I published in 1930:

"If simply as a civilian one considers the Reichswehr as it is now, then as a German taxpayer one can no longer look upon it as the defender of the Reich but as precisely the opposite. By its very nature and composition, the Reichswehr conjures up those very dangers against which it is held to be a guard. From the point of view of domestic politics it lies like a dead weight on democracy, self-government, and efforts at internationalism; it exasperates class oppositions to the extent of class warfare by its openly revealed sympathies

¹ This work (64 pp.: Verlag der Scholle, Berlin-Weissensee) contains the text of the memorandum of the Ministry of Defence on cruiser construction which was first published in England by Mr. Wickham Steed in the *Review of Reviews*.

for dictatorship. From the foreign political point of view it arouses the gravest distrust. The constant speculation of all Germany's neighbours and of all those who want a new Europe is on whom this army, heir to the Imperial tradition, would fall if it were in a position to fall on anyone."

These lines were written five years ago. Since then the evolution they hinted at has proceeded. Under the mask of a fine and noble devotion to German ways and German culture, demonic forces have been concentrated for the purpose of winning world dominion for a "Nordic Germanism" (that does not exist) by means of a victorious war which shall wipe out what is called "the shame of 1918" and set the pride and power of National Socialism high above the earlier achievements of history.

The first aims, the non-payment of war debts and the effective admission of military equality, were already realized under Schleicher and Papen. The work necessary for the realization of the second aim—the devotion of carefully hoarded sums to rearmament, the simultaneous suppression of all the opponents of this aim at home, and the unilateral repudiation of all obligations in international treaties—was swiftly obtained by the burning of the Reichstag (for which Hitler no longer dared to blame the

Communists in his "peace" policy speech of May 21, 1935), and was carried through by means of Hitler's four-year plan and Goering's secret air-power plan. On such a scale has this been done that to-day the nations surrounding Germany are anxiously facing the question whether they shall watch passively, as they have done hitherto, the fulfilment of the third aim, victorious war, or whether and by what means a world catastrophe can be avoided.

CHAPTER II

AIR POWER AS THE CHIEF FACTOR IN THE REARMAMENT OF GERMANY

(a) THE FINANCIAL ASPECTS

FROM the purely technical point of view, the rearmament of Germany began even before Hitler came into power. As early as January 1933 the French General Réquin concluded a retrospective study on "The Armaments and Military Power of Germany"¹ with the statement that Germany had recreated the essential bases of her military power of pre-war days and strengthened them for a war of aggression. Her whole theory of training was based on the offensive, and had no relation at all to the maintenance of order at home and the defence of the frontiers. At that time Réquin estimated that Germany's military power on her western frontier was equivalent to what it had been at the beginning of the world war. But in the days of 1914 there was a lack of the most modern of weapons, a weapon which has since been enormously developed, the air weapon.

¹ *Foreign Affairs*, January 1933, New York.

The air-weapon has not only increased four-fold its effectiveness as a missile weapon because of its potentialities in the use of poison gas, but its effectiveness is capable of practically endless increase seeing that it has broken into another dimension. The special characteristics of the air weapon have literally revolutionized war preparation and the method of waging war, not only from the technical but also from the political point of view.

This is why an investigation into the significance of German rearmament from the military and from the political point of view can practically be confined to a study of the air-weapon.

The "cry for the air weapon" in Germany was the result of the bitter lessons which the tanks had taught the Germans in the world war. They were the instruments of decision in 1918. "Not General Foch but General Tank defeated us," sighed a German general. As a result the people who entertained the idea of a war of revenge argued thus: If we were left behind in those days in the matter of the major weapon, we must now outstrip all others in the new major weapon and then our victory is certain.

The old proverb, "In waging war, money comes first, money comes second, and money

comes third," has, as far as modern war is concerned, become a truism which no State can neglect when it is a matter of preparing for war. It is particularly true in the case of the air weapon. There is *one* special fact to be remembered about that weapon, a fact which is not relevant in the case of any other. The air-weapon must *always* be in a state of permanent mobilization. In the event of war its production will be increased four-fold, but the air power calculated to be available at the beginning must be available at any hour for "the day," something that need not be said even of a navy. This increase in the degree of availability means increased expenditure of money. Besides, Germany must, swift as lightning, retrieve the lost opportunity. And finally the air-weapon alone will be useless unless there is a sufficiency of land weapons to exploit its gains.

In the financing of these extraordinary plans, extraordinary measures had to be adopted. First, the moneys that should have gone in war debts were diverted to this end. Then by dictatorial measures such as confiscation of property, wage-cuts, relief-cuts, and forced loans, money was got into the Treasury.

But what is decisive for the financing of

modern armaments is the fact that preparations for war and production for war have been entirely transformed since 1918. Before 1914 "war" took up the lesser part, that is to say, less than 50 per cent, of the total production of a nation. Naturally during the world war that proportion was greatly increased. But in former days, after great and catastrophic wars, there usually followed a reduction again to below 50 per cent. In none of the States which were engaged in the Great War has this happened. On the contrary, the total for the item "war" has, with only minor variations, moved steadily upward since 1924. The assertion that in all the States which took part in the war the item "war" has never accounted for less than 50 per cent of the budget will no doubt be controverted, for actually the budgets in the various nations show a very much lower figure.

For instance, take this table:¹

		1932-33 Per cent	1933-34 Per cent
Great Britain .. ..	..	13·7	15·4
Germany .. ..	..	7·9	11·0
Italy .. ..	..	28·8	22·7
France .. ..	..	35·0	34·0

¹ Taken from Oertzen, *Rüstung und Abrüstung*, Mittler, Berlin, 1934.

GERMANY'S AIR FORCE

	1932-33	1933-34
	<i>Per cent</i>	<i>Per cent</i>
Japan	26.0	37.0
Poland	41.9	40.8
Soviet Union	6.5	?
U.S.A.	19.4	18.5

But if one reckons under the item "war" not only the direct expenditure estimated for army, navy, and air force, but also, as the Committee of the Disarmament Conference agreed was justified, all those activities which would cease were it not for the social phenomenon of war, then a very different picture is visible. For it cannot be gainsaid that the pensions for participants in war, for war wounded and the kin of fallen soldiers, expenditure on strategic railways, quays, communications, and a militarized police, subsidies to industry for merchant shipping and armament factories, in part, too, subsidies for civil aviation, should as legitimately be included under the item "war" as are the oats for army horses.

Immediately after the direct expenditure on the armed forces in this item "war" come in importance the charges for interest and amortization of the loans raised to pay for the world war. If one adds up all that should thus go under the item "war," as does Benedict

Kautsky,¹ it becomes clear that in all the States which took part in the war, even in the United States, this item accounts for 50 per cent to 70 per cent of the income which the State gets from taxes and customs. For Britain, for instance, the Budget estimates of April 1935 can be shown thus:²

	<i>War</i>	£
National Debt	224,000,000
Army, Navy, Air Force	124,250,000
War Pensions	42,692,000
<hr/>		
Total	£390,942,000

The total ordinary expenditure for	£
1935-36 is estimated at	729,970,000
For war debts, army, navy, air force, and war pensions alone	390,942,000
For education, health, police, and other civil services are left only	339,028,000

But in this latter sum provision for various forms of expenditure are included which are actually needed for military purposes.

The situation as far as England is concerned is very fully revealed in the tables given by the National Peace Council in the *Peace Year*

¹ *Reparationen und Rüstungen*, pp. 220, Hess & Co., Vienna, 1931.

² *Financial Statement (1935-36)*, H.M.S.O., London, 1935.

Book. Each pound of the national expenditure is thus divided:

	s.	d.	s.	d.
EXPENDITURE DUE TO WAR (1934-35):				
Debt Services	6	5		
War Pensions	1	3		
Navy	1	7		
Army	1	2		
Air Force		6		
Miscellaneous Charges ¹		2		
FOR WAR	—		11	1

EXPENDITURE DUE TO HOME NEEDS:

Education	1	5		
Pensions	1	8		
Contributions to local revenue ..	1	4		
Unemployment Insurance ..	2	1		
Housing		6		
Customs and Excise		4		
Police (including Pensions) ..		4		
Industry (including Agriculture, Forestry, etc.)		2		
Health		2		
Northern Ireland Services ..		2		
Miscellaneous Charges		9		
FOR PEACE	—		8	11
			£1	0 0

These figures are based on Budget estimates for 1934-35 and relate only to the National Exchequer.

¹ These include charges for Imperial War Graves Commission and certain Foreign and Imperial Services.

The League of Nations has tried to ascertain how much of the actual expenditure on armaments appears under the military items of the budget. According to the *Annuaire militaire* 1933, these are the last available figures showing what is the actual percentage represented by the military estimates of the total moneys actually spent on armaments:

	<i>Per cent</i>		
Poland (1931-32)	72
Belgium	84
France	84
Britain (1929-30)	88
Italy	89
Soviet Union	92

These figures of the League of Nations are based on the official data supplied by the States themselves. How unreliable they are even for a democratic country like France was revealed by the deputy M. Pierre Cot, who was later Air Minister, when he declared that the actual military expenditure of France was not about twelve milliard francs but eighteen milliard, that is half as high again. In the twelve milliards of the estimates the expenditure on the eastern fortifications was not included.¹ Thus the true

¹ *Cahier de la Ligue des Droits de l'Homme*, December 20, 1930.

figure for France in the above table should be only 66 per cent and not 84 per cent.

The figures for Germany were and are more striking still. The Treaty of Versailles limited the armament of Germany down to the last man and the last rifle in store. None the less, the military expenditure varied from year to year considerably, and even rose in the days when the index of total trade was falling. In 1924 RM. 457,600,000 were assigned to the army and navy. Even then the Dawes memorandum gave the advice that "expenditure on the army could be reduced." When this very mild criticism of the American General Dawes appeared, the tiny German army was spending on "weapons, munitions, and war material" nearly as much as the old imperial army which was seven or eight times as large. Later, the picture became still more striking. For example, dozens of millions of marks were being assigned for "the replacement of artillery equipment as a result of the war." By 1930 the estimates for an army which had not varied in size had risen to RM. 715,900,000, and that was at a time when the total trade index was falling. It was declared in the Reichstag that that sum represented only 6.6 per cent of the total budget. But there were many omissions. The

pensions for the new army were omitted which in 1934 absorbed RM. 80,000,000, an expenditure which in Britain is shown in the military estimates. There was no mention of the "subsidies to munition factories" which in the budget were concealed under the item "burdens arising from the war." And above all, there was no mention in the budget of the Ministry of Defence of the (roughly) RM. 38,000,000 for aviation which was assigned mainly to schools for pilots and to air clubs. In 1932 the item "civil aviation" amounted to roughly RM. 42,000,000, then rose to roughly RM. 79,000,000, and in 1934 jumped to RM. 210,200,000. In the meantime a separate Air Ministry had been created of which Goering was made the head.

It is not possible to estimate the total expenditure on German aviation. Long before this, the American Commissioner for Reparations, Mr. Parker Gilbert, had been for years complaining of the lack of clarity in the German budget. A careful estimate such as was made by Mr. Gilbert, showed that even in 1930 of the RM. 2,300,000,000 for administrative purposes at least half went to purposes which were definitely warlike in character, that is to say RM. 1,100,000,000 to RM. 1,200,000,000, while

the budget for the army and navy showed only RM. 716,000,000.

The official *Statistisches Jahrbuch für das Deutsche Reich* gives the following details, which show how the total of the budget was augmented by the war account (estimate):

1931				Millions of RM.
Income of the Reich from taxes and customs				6,836
Expenditure which was definitely marked				
"Defence" or "War":				
Armed forces	..	..	..	759
Internal war debts	..	..	..	301
External war debts	..	..	..	1,793
War allowances	..	..	..	1,595
Total	..	..	..	4,448

According to official figures therefore military expenditure took no less than 65.1 per cent of the revenue from taxes and customs. In that are included neither the RM. 40,000,000 for civil aviation nor big items like the RM. 190,000,000 for the militarized police. In 1934 the total expenditure for the police amounted to RM. 752,000,000.

This is the picture supplied for 1934 by the *Statistisches Jahrbuch*:

Millions of RM.

<i>Income</i> from customs and taxes	5,087
--	-------

Expenditure for "Defence forces and War":

Army	658
Navy	236
Allotment for new defence forces ..	80
Allotment for former defence forces	1,095
Air Force	210
Police	190
Labour Service, etc.	250
Internal war debts	299
External war debts	140
Total	3,158

That is to say, 62 per cent against 64 per cent for the previous year. The decrease is entirely due to the drop in the "external war debts" from RM. 1,793,000,000 to RM. 140,000,000. No indication is given in the budget how the RM. 1,600,000,000 thus saved were allotted.

But the 1934 Budget is given only in summary form and is much less informative than earlier ones. For instance, there is no mention in it of the following items:

Millions of RM.

Inspector-General of the German	
Road system (motor roads for	
mobilization)	35
Reich Archiv (General Staff)	1

Millions of RM.

Central Information Bureau for war loss (Muster rolls)	1
Topographical Bureau (General Staff)	4
Industrial Emergency Corps (Tech- nische Nothilfe)	1
Ministry of Propaganda	28
Motor transport	2

There can be no doubt that other "war aims" are budgeted for under the items for the Labour, Agriculture, and other ministries. If, for instance, in the "general financial administration" there appears the item "subsidy for motor transport concerns—RM. 6,000,000," that means a subsidy to enable makers of motor transport to strengthen the chassis so as to make it capable of use in war (for machine-guns, etc.). In addition RM. 1,000,000 in the numerous "funds at the disposition of the ministry" and "other expenditure" are untraceable.

In the Budget for 1934 RM. 210,188,000 go to the Air Ministry. Of that sum RM. 50,000,000 are assigned to protection against air attack. But that estimate does not at all exhaust the expenditure devoted to the air weapon. In *Hitler Rearms*¹ the real expenditure is estimated

¹ Ed. Dorothy Woodman, John Lane, London, 1934.

at double these RM. 210,188,000, because there is no mention in the estimates of the transport aircraft of the railways which can at any moment be converted into bombers, nor of the aircraft allotted to the Storm Troops and to the police. Besides, both cities and communes make considerable contributions. As early as 1929-30 the Reich, the States, the Hansa towns, the communes, and communal associations had devoted RM. 37,600,000 to sport (stadia, sports grounds, and the general furtherance of sport). Of that sum the communes alone contributed RM. 35,000,000. Later on it is impossible to trace these.

One will not go far wrong if one estimates Germany's expenditure on the air weapon and on protection against air attack at one-tenth of her total economic and cultural effort. To it belongs for instance that branch of chemical production which is concerned with the equipment of the air weapon. This is why it is comprehensible that Mr. Baldwin, in his speech of November 28, 1934, said:

"The whole of the German money, ability, and training was thrown into her civil aviation until these recent days when she decided to throw it into military aviation. Therefore she undoubtedly has made much more progress than she would have done had civil

aviation not been for many years her only form of air service. I say that advisedly."

Mr. Baldwin compared Germany's effort in the field of civil aviation to that of France, and concluded:

"An efficient military air force can always cope with it (civil aviation), but, if there are no military air forces, then indeed the civil air forces would become the masters of the situation."

This conclusion was valid in the days when Germany possessed no recognizable military aviation, and was spending roughly RM. 50,000,000 on civil aviation. How much more valid is it to-day when Germany has invested in her air power not RM. 50,000,000, but some milliards of marks?

In the beginning of the third year of the Third Reich the development of secret war preparations was indicated by the fact that no budget was presented. Even during the war 1914-18 a yearly budget was presented at least to the Reichstag.

In spite of the lack of a budget one can imagine how many thousands of millions of marks National Socialism has invested in re-armament and in particular in the air weapon

during the two years of its rule. In every possible form the State is creating credit for its own use: forced loans from savings banks, communes, insurance companies. Rearmament is paid for by another form of forced loan, the "Drafts for Providing Labour" (Unemployment Bill) (*Arbeitsbeschaffungswechsel*) which are, in practice, bills at long date. Payment of these is postponed to some dream Reich, probably the "Fourth Reich." But the Vice-President of the Deutsche Reichsbank, Dreyse, is already awakening. He issued a warning in the journal *Die Staatsbank* that "the way to Communism might be prepared" through the National Socialist financial policy. He himself estimates internal floating debts at RM. 8,000,000,000. Other estimates even go as high as RM. 14,000,000,000 to 20,000,000,000. This must be taken as forced war loan.

The air force's share in this amount was the sum required for the construction and maintenance of roughly 4,000 military aeroplanes available in the spring of 1935. How much did these cost?

It is significant that in every country people are told a lot about the marvels of the aeroplane and nothing about its cost. According to figures given in *Hitler Rearms*, in the *Aircraft*

Year Book 1934 (U.S.A.), and in an article in the periodical *L'Europe Nouvelle* (22, xii, 1934), which had a preface by the French Air Minister General Dénain, the average price of an aeroplane in 1934 can be estimated at £15,000.

When pressed by taxpayers during the spring debates about the increase of the air force, the English Government gave the price of a bombing plane of latest design at £25,000. Of course, not every German aeroplane can be estimated at a cost of £25,000. But with an average output of *at least* fifteen planes a day the tendency is to build larger and consequently more expensive planes. This tendency must be recognized.

One can hardly assume that the Germans keep their 4,000 newly built planes in service all the time. Because of the necessity of keeping secret the exact number and because of the difficulty of storage, one can believe them if they give only 1,500 planes as first line. But they conceal that twice as many, three, four—or to quote Lord Rothermere even five—times as many planes have been demounted after their test flights and are now being kept in store. They are only putting into practice the opinion of Lord Trenchard who said that in a future war the average monthly loss of aeroplanes

would come up to 100 per cent. Which means that in her supply of aeroplanes (mounted, demounted, and spares) Germany is now prepared for an aggressive war lasting several months.

According to careful estimates, Germany has spent alone on the construction of her military aeroplanes about RM. 1,000,000,000, or £90,000,000 to £100,000,000.

But the cost of building aeroplanes only forms a small part of the total expenditure on the air weapon.

The English Budget for 1935-36 estimates a total expenditure of £20,650,000. This is divided as follows:

			£
Complete airframes	..	..	3,577,000
Complete engines	..	..	2,246,000
Airframe spares and miscellaneous			627,000
Engine spares	..	..	446,000
<hr/>			
Total	..	..	£6,896,000

Assuming that in Germany the different divisions of expenditure are in the same proportion, the total German appropriation during the two years of their concealed war preparation was more than RM. 3,000,000,000 for their air weapon alone.

In spite of the forced construction of aeroplanes in Germany, a larger part of the military budget must still be spent on the army and navy, all the more as Germany is now re-arming also on the sea by building submarines and big battleships.

Again compared with the British Budget for 1935-36:

		£
Army, Navy, Air Force	..	124,250,000
Air Force alone	.. ..	20,650,000

The proportion between the air budget and the total budget would be 1 : 6.

Supposing that Germany spent one-fifth of her rearmament expenditure on the air weapon, then the following figures are arrived at:

		RM.
Germany's air force, 1933-34	..	3,000,000,000
Germany's army and navy	..	12,000,000,000

Two years' rearmament .. RM. 15,000,000,000

This expenditure corresponds with the estimated internal debt of RM. 15,000,000,000 to 20,000,000,000.

During the two years of the Third Reich Germany has spent per year for rearmament alone an amount equal to the total British

Budget. That was only rendered possible by creating a war psychosis among the German people. If this process in Germany cannot be stopped and redressed, it will inevitably drag down all neighbour nations into its whirlpool.

(b) SIZE AND MILITARY STRENGTH OF THE
GERMAN AIR FORCE

Before I go on to analyse the effect of the existence of Germany's war air fleet on the situation in Europe, I shall try to give some idea of its present size. Here I rely on the testimony, which has not been contradicted, of the Labour Member of Parliament, Mr. Seymour Cocks. As long as a year ago, speaking in the House of Commons on February 6, 1934, Mr. Cocks said:

"In view of all these circumstances, it is nonsense to suppose that the nations will agree on a policy of abolition of military aircraft in the next two years, and that means that Germany will be able to build up a great air force in order to shower bombs on Paris and London and seek to gain her revenge for her defeat in the last war. But Germany is not waiting for two years to get this air fleet; she has it already. I have here a document, translated from the German, which gives an elaborate and detailed account of the present

air organization in Germany and of the Air Ministry which has been set up. I do not propose to read more than one paragraph which describes the present position of German air forces.

“The German air fleet, ready for action up to the spring of 1934, is composed of:

“(1) Transport planes which can be transformed in a very short time into war planes. The number can be estimated at about 500 to 600.

“(2) Schooling and sport planes of the German Air Sport League (Deutscher Luftsport-Verband) and co-ordinated organizations (S.A. and S.S. Air Groups, the German Air League, Aero Club of Germany, etc.). These are for the most part light planes usable for chasing planes, whilst the first-named transport planes can be used as day or night bombers. The number in this case is about 500 to 600.

“(3) Experimental planes and new constructions of the big aeroplane factories, which can be estimated as between 50 and to 100.

“(4) Military planes which are stored in the foreign “daughter” firms of the German factories. Careful estimate, about 300.

“(5) War aeroplanes of all kinds which are being secretly built in Germany itself and whose number is not too highly estimated at 400 to 500.”

“All this shows that by the 1st May, 1934, Germany will have an air fleet of 1,750 to 2,100 aeroplanes at her

disposal. The number of engines which will be ready by this time may be estimated at 5,000 to 6,000.

"Still more important, however, is the question which, in the coming war where an air fleet will be the principal weapon, will be decisive: how high will the production capacity of the air industry be? In the last year of the war, 1918, Germany was producing per month on an average about 2,500 aeroplanes and 4,000 aeroplane engines.

"If we consider the great progress of technique, the development of German industry and especially its adaptation to mass production, the entire production capacity of the war industry for air armaments can be estimated as 3,000 to 4,000 aeroplanes and 10,000 aeroplane engines monthly.

"In other words, Germany would be able to construct within a year about the same air fleet as France for instance possesses to-day."

Asked by the Lord Privy Seal, Mr. Eden, as to the origin of the document, Mr. Cocks replied:

"It is a document translated from the German which was put into my hands. The only authority I can give for it is my own. You may doubt these figures, but I believe them to have a certain amount of accuracy behind them. I shall leave it at that."

Sir Austen Chamberlain asked whether it was a question of a private communication

from a German correspondent or of a translation of an official document. Mr. Cocks replied:

"It is the translation of a document which has been put into my hands. It is not an official document. I am afraid I cannot say anything more about it. I do not ask Hon. Members to accept it. They can take it or leave it."

Of what Mr. Cocks revealed, not a single British paper, not even the organ of his own party, the *Daily Herald*, took any notice. A representative of one of the great British political parties asserted in the House of Commons that a major European State in breach of solemn treaties had secretly created a giant air fleet which was rapidly drawing level with the British air fleet, and yet British public opinion showed not the least concern.

There were none of the usual denials from the German side and none of the excitement which used to follow any revelations about the "Black Reichswehr" when "traitors" were locked up because of a couple of concealed guns, and ambassadors and ministers were stung into activity.

None the less, these revelations did not remain without effect, although the connection between them and later events was carefully

concealed. On February 20, 1934, there appeared in the *Daily Mail* an interview with the German Air Minister Goering, in which he declared that Germany possessed only about 300 civil machines. As Minister, it was, he said, his task in the interest of German security to create a German war fleet of a strength equivalent to 30 per cent to 40 per cent of the united strength of the States bordering on Germany—France, Belgium, Poland, and Czechoslovakia. Without including Belgium, he reckoned that strength at 4,246 machines. He would make it his earnest endeavour to raise the German fleet to the desired proportion in two years, and make it second to none.

This interview, which was obviously an answer to Mr. Cocks's revelations, actually confirmed them, for the proportion which Goering said he sought to obtain is, in figures, practically identical with the figures given by Mr. Cocks.

A further link in the chain was supplied in the session of the House of Commons on March 8, 1934, which the *Observer* said was "the most important sitting since the end of the world war." Mr. Churchill then uttered the phrase, "the German menace," of a Germany in whose hands would in a year perhaps or eighteen

Governments of France, Italy, the United States, and Germany, Mr. Baldwin was compelled to make the following admission:

"I had forgotten that when I mentioned the service aircraft in Germany I should have added that among them are a number of bombers. We do not know the exact number but they are there."

In the subsequent debate we may note that Captain Guest, who is a specialist, recalled the details given to the French Chamber by the War Minister, Marshal Pétain, that the "factory capacity of the German aircraft industry was at the moment as high as 2,500 machines a month."

Since that time further revelations about the development of the German air force followed in quick succession. There is no need to quote them. The game which was played on February 6, 1934, is constantly repeated. Things which were publicly denied are given away or even admitted in obscure passages in scientific literature or in semi-official statements.

Nor should one forget that Germany is relatively favourably placed. For when, on May 1, 1933, she began to construct a fleet at top speed, she was not burdened with a number of obsolete machines. She was, in fact, in a

position not dissimilar to that of the United States when, hitherto unarmed for war, that country entered the war in 1917. Then it was found that it took nineteen months after mobilization to get the first four American guns to the front ready to fire.¹ But as far as aeroplanes and their delivery were concerned, every specialist witness agrees that the time was very much shorter.²

This advantage which Germany possesses over all other States is made clear in an interview which the world-famous Dutch engineer Fokker gave to one of Reuter's correspondents. Fokker said:

"There is one danger which most countries do not appreciate, and that is that the largest percentage of their machines are obsolete. It is not a question of the number of machines which a country possesses but of their fighting value and of swiftness and capacity of production."

Hunke³ estimates the number of war aeroplanes which are ready for use in war in the lands bordering Germany, reckoning only those which fulfil modern requirements, as equivalent

¹ P. Noel Baker, *Disarmament*, pp. 314, 315.

² Opinion of the League of Nations Joint Committee.

³ Dr. H. Hunke, *Luftgefahr und Luftschutz*, p. 190, Mittler, Berlin, 1933.

to 30 to 40 per cent of the total number of machines possessed by these States. He puts the total for all these States at between 1,000 to 1,500. These relative and absolute figures almost coincide with the figures given in the Goering interview of February 20, 1934. Hunke considered that Germany ought to possess 4,000 to 5,000 machines in order to be protected against her neighbours. This demand for 4,000 modern machines appears again and again in the National Socialist press. That is a military air force such as is not possessed by any European country, hardly by the United States.

If we test the minimum figures from various official data whose accuracy is accepted, we get the following results:

- “(1) that the German air force, as far as fighting planes are concerned, as early as the summer of 1934, was equivalent at least to 50 per cent of the British first line home fleet and to a lesser but still considerable percentage of the French fleet;
- “(2) that the fighting portion of the German air fleet is composed of swifter and stronger machines than the corresponding fighting portion of the French and British air fleets and the latest types are fitted with the newest technical inventions such as apparatus for automatic steering, spark interrupters (Funkenunterbrecher), etc.”

The extent to which the international armaments industry has influenced the building up of the German air force may be seen from the following data which emanate from the United States Senate Committee that is investigating the armaments industry. The value of deliveries of American aeroplane and motor manufacturers to Germany in American dollars was as follows:

1930	..	..	..	..	51,000
1931	..	..	..	..	2,000
1932	..	..	..	..	6,000
1933	..	..	..	..	272,000
1934 (January 1st to August 31st)					1,445,000

The deliveries to Holland on the part of American armaments firms which were established by the Investigating Committee as amounting to a value in the same period of \$800,000 has not been reckoned here, although the Committee let it be known to what extent these exports to Holland were intended for Germany.

On November 9, 1933, the *Daily Herald* reported that the British Rolls-Royce works had delivered to the German air force a number of aeroplane motors of the new "Kestrel" type.

The game of February 1934 was repeated exactly a year later. After Germany had shocked the world, many estimates, some good and some exaggerated, were published about the strength of the German air force. Far too little notice was taken of the fact that the *Nationalzeitung* in Essen (Goering's paper) demanded 8,720 aeroplanes on February 19, 1935, exactly a year after General Goering's interview with a representative of the *Daily Mail*, when he demanded 1,750 to 2,100 aeroplanes. The increased demand was based on the air strength of France and Belgium.

Only Mr. Winston Churchill, Sir Austen Chamberlain, and Mr. Anthony Eden paid attention to the announcement of Goering's 2,000 war planes in February 1934. One year later 3,000 to 4,000 planes, demanded already in 1933, were ready, and then General Goering demanded twice as many, namely 8,720.

The announcement made on May 15, 1935, of a further increase of the English air force—first line to 1,460 modern fighting planes for home defence alone—indicated the strength at which the German air force was estimated. Similar increases followed in all the countries round Germany.

Mr. Baldwin's remark of July 30, 1934, that England's frontier was on the Rhine was almost forgotten. General Goering in response had remarked that it might just as well be said that Germany's frontier was at Dover. The "Statement relating to Defence" in the English White Paper¹ of March 1, 1935, unmistakably repeated Mr. Baldwin's remark:

"Technical development in the air is taking place very rapidly in respect, for example, of such matters as speed, height, endurance, carrying capacity, and potentialities for destruction. The range of territory on the continent of Europe from which air attacks could be launched against this country is constantly extending and will continue to extend; and if, in war, an enemy were in possession of the countries bordering the Channel, the area of Great Britain liable to his attacks would be still further increased. The weight of the attack would be much greater, owing to the quicker 'turn round' of the bombers and their increased bomb load at shorter ranges. The increase in speed, range and height accentuates the difficulty of obtaining warning in time to bring defensive aircraft into action in favourable conditions to repel attacks. For these reasons the importance of the integrity of certain territories on the other side of the Channel and North

¹ "Statement Relating to Defence," H.M.S.O., London, 1935.

Sea, which for centuries has been, and still remains, a vital interest to this country from a Naval point of view, looms larger than ever when air defence is also taken into consideration."

Some comparisons:

	<i>Aerodromes</i>
<i>England</i> (cp. Jane's <i>All the World's Aircraft</i> , p. 590, Sampson Low, London, 1935) ..	125
New Aircraft Stations (according to the Government's proposals in May 1935) ..	49
Total	174
<i>France</i> (cp. Jane)	188
<i>United States</i> (cp. <i>Aircraft Year Book</i> , 1934, p. 502, New York, U.S.A.)	757
<i>Germany</i> (cp. Dorothy Woodman's <i>Hitlers Luftflotte startbereit</i> , p. 182, Editions du Carrefour, Paris, 1935, with a map of aerodromes)	261

Of these 261 aerodromes at least 100 are for purely military purposes.

Some of these aerodromes have bombproof underground hangars protected by anti-aircraft batteries. Some are built to accommodate 180 planes. If the military aerodromes only take an average of 40 planes each, we have again the

figure of 4,000 planes of the latest type ready for use.

There is political significance in the fact that such aerodromes of purely military character have been built even in the demilitarized Rhineland zone. Thus the obligations freely assumed under the Locarno Treaty have been gravely violated.

According to Dr. Werner von Langsdorff in his *Taschenbuch der Luftflotten*, 1934¹ there are in Germany thirty-six firms manufacturing aeroplanes and six firms manufacturing aeroplane motors.

Dr. Langsdorff gives the following comparisons:

Germany..	..	..	36 firms
England ..	..	..	38 firms
France ..	..	..	51 firms
United States	..	..	94 firms

Meanwhile, according to Miss Dorothy Woodman, the number of German aircraft firms has increased from thirty-six to forty-seven. In addition she states that there are

17 firms for aeroplane accessories;

18 firms for aeroplane motors;

¹ Lehmann, Munich, p. 310.

- 6 firms for aeroplane armaments;
- 22 firms for board instruments (?);
- 10 firms for materials, etc., for protection against fire
and for "black-outs";
- 22 firms for aerodrome building.

(c) PROTECTION AGAINST AIR ATTACK

As to the organization for protection against air attack, Lieut.-General Grimme declared to the German League for Protection against Air Attack (Reichsluftschutzbund), that the League has now nearly six million members who are organized in 21,500 associations. Nine thousand teachers in 2,200 schools give instruction to the population in measures of protection. Among the 2,200,000 German men and women who are instructed in protective measures are 1,100,000 house guards.

(d) AIR FORCE PERSONNEL

For Germany we give the following estimate. The French General Debeney reckoned that the equipment for an aeroplane, including men on the ground but not pilots, is 46 men per machine. If one takes 50 as a figure, including pilots, reserves, etc., then an air force of 1,000 planes requires 50,000 men, and if Germany's

air force to-day consists of 4,000 planes it means that 200,000 men are mobilized for her air force. This gives a fighting force of 200,000 men, apart from the army and the navy. The period of service in this air force is four years, in the army only two years.

As regards the size of the army, which on March 16, 1935, was given by the Reich Government as thirty-six divisions, it should be pointed out that this new army is actually 1,100,000 men strong. For according to paragraph 8 of the Conscription Law (Wehrgesetz) the fulfilment of Labour Service is a condition for active service in the army. It takes the place of the training year of the other armies.

(e) THE SPECIAL EQUIPMENT OF THE GERMAN AIR
FORCE FOR GAS AND BACTERIAL ATTACK

National Socialism undertook to give this air armada which General Goering described as "second to none" corresponding equipment.

In this connection we may cite the revelations of Mr. Wickham Steed in the *Nineteenth Century* of July 1, 1934, and ascribe to them the same quality of alarming significance as we gave to the revelations of Mr. Cocks on the extent to which Germany had armed in the air. Mr.

Steed showed that for years, and not simply after Hitler's accession to power, the Reichswehr had systematically experimented with the possibilities of discharging yellow cross (mustard) gas by completely new methods from aeroplanes. So far gas has been dischargeable from aircraft only by bomb. We give Mr. Steed's article textually in the appendix (p. 115).

Yellow cross is a poison which is sprayed in drops on the skin, and a gas mask is no protection against it, because it penetrates through the skin into the body. The experiments were made by German agents in the Paris Underground with a harmless bacillus called *Micrococcus prodigiosus*, to which is ascribed the medieval miracle of the bleeding host. From the documents published by Mr. Steed it is clear that similar experiments had been carried out in the London "tubes." These documents make it also clear that these experiments were begun in the days of Bruening's chancellorship, but under considerable handicaps. On May 16, 1933, however, the day before the great peace speech delivered in the Reichstag by Hitler, the Leader had signed a decree which removed all hindrances to experiments which would give the German war fleet, then of course in construction, such equipment as, if successfully applied, would

make Germany at a stroke the master of Europe, just as the Reichstag fire made Hitler the master of Germany.

As early as 1922 Major Victor Lefebure pointed out the effectiveness of the air weapon in conjunction with poison gas, especially with regard to London. He wrote in the *Grotius Society Transactions*, vol. 7, pp. 153-66, about "Chemical Warfare—Possibilities of its Control" on p. 166:

"Aircraft are the most effective instruments for a gas attack. . . . It would be practicable to put out of action by an aerial gas attack half a million persons in London. This would mean that the whole of London would be demoralized."

When we think of the utter monstrousness that is behind such deliberate preparation, we cannot but say something about the psychological aspects of a planned crime which outdoes any other crime hitherto committed against humanity. Even assuming the sincerity of the National Socialists in their belief that Germany's "foes" wish to destroy her and her people, such preparations for war are not justified nor do their perpetrators escape censure by pleading necessity. A whole series of circumstances show clearly, however, that the highest grades

of the National Socialist hierarchy recognize fully the untruthfulness of their propaganda. Some of the Nationalist militarists who are still capable of professional thought have at least in principle surrendered, and recognize that there are limits which the psycho-mechanical weapon cannot overstep. We may quote Major Soldan:¹

"We speak of the fiasco of the army of millions, and we have to admit a general fiasco of methods of war. Armies equipped in the modern manner cannot to-day fight a decisive battle. The loss in men and morale will, even from the point of view of material, end in crisis. Germany's present situation ought no more to be considered in a technical judgment of the future possibilities of war than obsolete conceptions should be allowed to play part in our thought. It is true that the decision lies not with dead matter but with the living will, and we ought not to misconceive things so far as to assert that the world war has finally buried all that goes by the name of military romanticism. But the fieriest and noblest will is impotent when faced with a preponderance, even a slight preponderance, of material strength on the part of the enemy.

"The relation between technical perfection of weapons and the strength of the physical powers of

¹ G. Soldan, *Der Mensch und die Schlacht der Zukunft*, p. 108, Stalling, Oldenburg, 1925.

the human organism is what is decisive. That relation must necessarily work as catastrophically for the soldiers of the future as it did for those of the world war. That relation can only alter when a nation, by surprise, has at its exclusive disposal a new and radically effective weapon, e.g. a terribly effective gas. In proportion as the possibility of this is not excluded, it ought to be made the starting-point of serious study."

National Socialism seeks after a master weapon as Soldan conceives it. But it does not make "the possibility of a new type of radically effective weapon the starting-point of study"; it makes the search for it the very centre of its activities. Whether the Germans, as they search, really have in their possession the "terribly effective gas" of Soldan's hopes or whether they possess much more fabulous weapons in the shape of deadly rays—who knows? What is certain is that, according to Mr. Steed's revelations, they have at least devised a new process which is almost a work of genius, whereby they can spread the deadliest gases and even possibly bacteria over the life centres of great States with the rapidity of a thunderbolt.

Some idea of the effect of such attacks on London by two hundred to three hundred modern bombing planes was given by Fokker

in the interview from which we have already quoted. He pointed out that the chief result of air attacks would be to create panic on a scale not yet known.

As far as the British are concerned, Mr. Steed's documents should not have come as a surprise, for as long ago as 1928 (!) the head of the explosives section in the Ministry of War during the world war, the Earl of Halsbury, had told the House of Lords in the sitting on July 11th of the unavoidable consequences of a poison gas attack on London from the air.¹ The occasion for his speech was a question asked in connection with the now notorious phosgene catastrophe in Hamburg on May 20, 1928. The earl, himself a chemist, went on to say:

"Very few people have considered what a very deadly thing this [phosgene] is. I will take as an example an area with which we are all familiar. I am not going to give my own figures. Take a triangle composed of the centre of London, from Chalk in the north to Clapham on the south and the docks in the east. That triangle really contains most of what is important in London. It contains the most densely populated areas and the most important areas. The total amount of phosgene gas to produce a lethal

¹ *Parliamentary Debates*, House of Lords, 1928, vol. 7, pp. 970-3.

atmosphere over the whole of that area up to forty feet is under 2,000 tons. From the war figures 2,000 tons was a negligible amount for an enemy to be able to put in. That amount could be put in by enemy aircraft at the present time.

"Up till now I have been dealing only with phosgene gas. Phosgene gas for the purposes of war is as out of date as the blunderbuss. . . . The gases which I have in mind are gases whose base is arsenic, and they are brought over in liquid form so that they do not have to have any specially strong containers. They are blown up into fine smoke by a small amount of high explosive. This is what is said about them:

"'. . . Marked symptoms are produced by exposure to one part of diphenylchloroarsine in 50 million parts of air, and it may be stated in general that this concentration forms the limit of tolerance of ordinary individuals for an exposure lasting five minutes. . . . The Germans state that diphenylcyanoarsine is an even more powerful irritant than diphenylchloroarsine. These substances are generally used to cause such sensory irritation that the victim is unable to tolerate a respirator, and they are therefore often followed by an attack of asphyxiant gases.'

"There you have the modern gas. Translate those figures into the ones I gave you—2,000 tons to a concentration of one in a million. It comes down to only 40 tons of this new gas.

"It will be answered: 'Oh yes, but you are assuming that each bomb is most carefully spread in mathematical precision all over the area! I agree. But double, treble, and multiply by ten, and you still have only something in the nature of 400 tons to do the thing ten times over. It is not a matter only of people who are going necessarily to be killed. Even a bad attack of gassing would not be very pleasant.

" 'A remarkable feature of the severe gases is the intense mental distress which accompanies the symptoms. Even slight cases feel and look miserable, until the irritation passes off, and the picture of utter dejection and hopeless misery furnished by severe cases has no counterpart in any other type of gas poisoning. Occasionally the physical depression results in the temporary loss of mental control, and men have been known to act as though driven mad by their pain and misery.'

"That is the danger which is menacing us now.

"... Take the bomb I have in mind—one of our largest bombs. Assume that it dropped at Piccadilly Circus and that it made a direct hit on the Criterion. It would probably have demolished that building. Everybody in the building would probably have been killed, and a few outside might have been killed or hurt. The danger from destruction would then have been over. If the bomb dropped in Piccadilly Circus and did not hit any building the casualties would be far fewer. Even so, once the explosion had occurred

the danger would be over. Consider that same bomb filled with poison gas that I have just been talking about. You would get an atmosphere which would kill every man, woman, and child in an area from Regent's Park to the Thames. The figures I have given are not exaggerated. I would to God they were, but they are not. The book I have been reading from is not a book picked up casually anywhere. It is a book published by our War Office as the *Manual of Medical Aspects of Chemical Warfare*. It is published at 9d., and I would suggest that it should be given away. If every adult in this country were to read that, you might have such a wave of indignant and righteous horror that people would do anything to make some agreement which would put these things under international control and prevent their use in future warfare. That is one suggestion I put forward (*Parliamentary Debates*, House of Lords, vol. 71, pp. 970-3, 1928)."

Lord Halsbury asserted that four hundred tons of an arsenic composition (blue cross type) was ten times more than was needed to gas out the above-mentioned triangle of Central London.

In order to get some idea to what extent the Germans are preparing to develop the arsenic weapon (blue cross, lewisite, etc.) let us turn to the brochure of the Swedish historian, Albin Cullberg, *Un Cri d'Alarme: Occidentaux*,

*Ouvrez les Yeux sur le Péril mortel.*¹ In the Swedish Boliden mine (64° 55' N.) there was a dump of nearly 50,000 tons with 99·5 per cent arsenical content ready mined and perhaps even now sent to Germany. The purchase was made by the German Air Ministry.

From these 50,000 tons of arsenic could at a minimum be made:

“about 102,800 tons of Clark II (diphenylcyanoarsine of which Lord Halsbury spoke);

“or about 111,200 tons of adamsite (diphenylamino-arsinchloride, which according to Hanslian is the most easily manufactured blue cross type);

“or about 69,360 tons of Lewisite (*beta*-chlorvinyl-arsindichloride, the ‘dew of death’ of the Americans Fries and West).”

From Lord Halsbury's statements we may estimate that with this amount of arsenical compound not only Paris and London but all the European capitals could be gassed out, and not once only but at least a dozen times.

This example shows how methodically the German war economic organization is collecting the raw material for poison gas manufacture

¹ Lavauzelle, Paris, 1934.

which Germany lacks. Germany has only very small arsenic deposits.

The raw materials necessary for the manufacture of yellow cross, phosgene, and green cross, on the other hand, Germany possesses in almost inexhaustible quantities. According to the official report of the *Inquiry into Germany's Economic Position* of 1930 the chemical production of Germany is still 60 per cent greater than that of Britain and two and a half times as great as that of France.

In his book *The Riddle of the Rhine*, the British Major Victor Lefebure, an eminent gas specialist, thus spoke of the power of the German chemical industry:

"But the gigantic I.G. (I.G. Farbenindustrie, A.G., Frankfurt/Main) controls in its great hand a sword or a plough, for war or peace, at will. This is no far-fetched metaphor."

It may well be suspected that serious attempts would be made, as foreshadowed in Mr. Steed's documents, to cause epidemics among men and animals by the shower process there described. Here is one indication. It is certain that in the war the Germans had a good deal of success in infecting the fodder of horses.¹

¹ League of Nations' Publications and Pagniello, *L'arma chimica*, Torino, 1927.

Suspicion is, at all events, strengthened by the publication of a former German naval officer, Dr. Helmut Klotz, in the *Annales Politiques et Littéraires* of September 14, 1934. There and also in the *Berlin Diaries* by the same author—and then only in the American but not in the English edition—it is shown that, as early as January 10, 1933, Hitler had addressed a memorandum to Hindenburg in which he warmly recommended the use of bacteria in war in order to win a “swift and brilliant victory on two fronts.” France and Poland are meant.

After Hitler came into power, Herr Heinrich Himmler, the head of the S.S., devised a bomb which would resist the pressure of two to three atmospheres, would open automatically, and could take a time fuse and would spray out bacteria cultures. Herr Himmler's remark that the rest would be done by the current of air in the main streets is completely in keeping with the experiments (described in Mr. Steed's documents) made by German secret agents in Paris and London.

From Dr. Klotz we also learn that there were very different opinions held in the Reichswehr as to the use of bacteria in war. The murder of General von Bredow in the “clean-up” of

June 30, 1934, may have been not unconnected therewith.

The employment of gas in war as described in Mr. Steed's documents, and still more the preparation of bacterial warfare through apparatus like that invented by Himmler, makes very plain the offensive character of the war preparations of National Socialism. The significance of the air weapon and its relation to political conceptions of defence are quite clear. It has no relation at all to defence of the national territory, none whatever. Its use is part of a policy of indiscriminate destruction. Nor will National Socialism shrink from preparing and using this weapon with the same burning vehemence as it has crushed the German people and wishes to crush others.

(f) CONCLUSION

The European problem in the early months of 1934 was: Can world public opinion be mobilized to recognize clearly the menace of the growing German air force?

This problem was not solved. German tactics succeeded in baffling and deceiving the world until March 10, 1935, when General Hermann Goering introduced his air force officially.

The European problem in the early months of 1935 is: Can world public opinion be mobilized to see at last that this deception is being continued, especially since it has become obvious that Germany's air force has achieved superiority in Europe?

CHAPTER III

THE SIGNIFICANCE OF THE NEW GERMAN AIR FORCE FOR THE MILITARY SITUATION IN EUROPE

THE existence of the German air force has completely altered the relations, from the point of view of military strength, of the great industrial States of Europe. Whether one places Germany industrially in the fifth place among them, that is to say before Britain, or whether one places her elsewhere, in the spring of 1935 her air force in any case is strong enough to tip the balance.

Every simple weapon, from the boxer's fist and the revolver to the field gun, can be used either as an offensive or a defensive weapon, according to its relation to the strength of the opponent. All such weapons can only be used directly at the front, a front which in general may be said to be identical with the frontier of a country. The question, therefore, whether a weapon is offensive is settled by settling the question who is the aggressor in war, even in a preventive war. The position is somewhat different with long-range guns which can hit

a target 75 to 100 miles away. They always produce their effect far from the front, the frontier line, and, if a country is invaded, behind its front. The position with these, then, is different from the position in which one defends one's frontier by field guns, mines, and machine guns against an invader. The long-range weapons are always aimed to strike behind the front, that is to say, against the civil population whose protection is the sole aim of "the defence of the national territory," for the civil population, when a State is at war, remains the reservoir of "defensive power."

Successful attack on the civil population and on its life-centres is therefore the decisive factor in the success of an attack. The side whose will to war is lamed or destroyed is the vanquished. As the Kellogg Pact considers attacks on a State without will to war as a crime, efforts have been made to forbid weapons which are purely offensive in character. Besides the long-range gun, the offensive weapon in the purest form hitherto known is the air weapon, whose use has only one object since it is mainly directed against the political and economic life-nerves of the land behind the front. This use would be crowned with the greatest success if it came as a surprise, that is to say, if it was

employed either without a declaration of war or while mobilization was going on. It is true that it is impossible to capture frontier defences by aircraft, but it is quite unnecessary to capture them in order to dictate peace to a dazed nation in the smoking ruins of its capital.

That is not to say that land weapons are without significance for the final issue of a modern war. Even cavalry patrols may at moments of crisis be decisive in effect. But in the case of military politicians of the stamp of the National Socialists what matters less than the facts are the ideas on which they base action, and through the application of which they snatch the initiative from the enemy, if he does not meet their action with superior counter-action.

Everything goes to show that National Socialism is fascinated by the real or imaginary effect of the air weapon, as the ideal offensive, that is to say, surprise weapon, and that it builds all its plans of conquest upon it.

It is true that by its very nature the air weapon is a double-edged one. It is an instrument whose effective use involves sacrifice. For even if it succeeds in practically wiping out the enemy air force, a remnant of that force will suffice to strike a mortal blow by counter-

attack on the life-centres of the aggressor, his capital, and his industrial cities. At present the relative size of air forces even in their actual inequality leaves this possibility to the weaker side. The air weapon is in character like the spear of the god Indra in the heroic sagas of India. It always brings destruction on the object aimed at, but after it is cast it returns of its own accord to the god.

If, then, Germany succeeded in assuring its existing war fleet in the air against all the efforts made at disarmament—it can otherwise only be taken from her as a result of war—then there are three Powers in Central Europe who can each hold that it possesses the Indra-spear: France, Italy, and Germany. Each of these States is determined to retain that weapon, that is to say, not to abandon it until the others do, since that State will be the victor who remains in possession of Indra's spear. Any two opponents would wipe each other out; that is to say, if war broke out between Germany and Italy, France would be the victor without using her weapon. Germany, therefore, needs only to refuse to attack in order to be the *tertius gaudens* and become master of Europe without fighting. (Compare the somewhat analogous position of the British Navy in the

world war which avoided attacking and was intact after victory had been won.) As a result of a country like Germany basing its whole internal organization on the idea of war, the States which are still democratic would have to accommodate themselves to a like organization. The actual desire for a gigantic war potential would almost certainly soon be directed against the weakest point of resistance, and that would be found in the lands which were weaker economically and from the point of view of war technique. As in the Middle Ages, when firearms were introduced, leagues of towns were determined not to fight because even their heavy walls could not resist the range and effectiveness of the heavy guns; as in the age of railways the national States were united by a net of communications which made it possible for a mobilized army to be thrown on the frontiers within twenty-four hours; so modern industrial States, whose factories lie within the range of modern day and night bombers, armed with incendiary bombs and poison gas, will unwillingly avow themselves pacifist—but only within the range of war air fleets. In his Reichstag speech of May 21, 1935, even Herr Hitler poses as a pacifist!

The same Herr Hitler has been poisoning

the minds of the German people for many years through his book *Mein Kampf*, in which he declared that France must be annihilated. He has never revoked this demand clearly enough to make the German people realize any change in his policy.

It would be appropriate to compare here the fighting capacities of Germany and France. Total fighting capacity is most clearly seen from the war potential of a country. According to the tables in my book *Revolution des Friedens*,¹ Germany's war potential has 123.3 points, France's (without colonies) 75.9. This result is obtained from reckoning the relation of the extent of production of 40,000 articles, as taken from the economic statistics of the League of Nations and other sources. Only the economic and technical (mineral wealth, industry, and transport media) and the biological (man-power and food-power) is reckoned and not the geographical (strategic position) or the psychological (moral preparation for war, potentialities of research, etc.).

Thus the war potential of Germany is about two-fifths more than that of France *minus* her colonies. If one reckons that of the colonies at

¹ O. Lehmann-Russbuehdt, *Die Revolution des Friedens*, p. 144. E. Laub, Berlin, 1931.

23·1 points, then the proportion is reduced by one-fifth in France's favour, but Germany still remains one-fifth ahead. This explanation of relative strength is particularly necessary if one is to estimate the relative air power. Experts like Mr. Philip Noel Baker and the Joint Commission of the League of Nations come to the conclusion that six to nine months are necessary for the production of guns before they can be brought to the front in any number. On the other hand, stocks for the carrying-on of gas and air warfare can easily be vastly increased. Poison gas, like chlorine and phosgene, can be produced very quickly.

In spite of her unfavourable frontier position, Germany has, if war breaks out, the advantage of the interior lines and has potentially the advantage since, as a result of her superior industrial strength, she is superior by two-fifths in the chief weapon in the war of the future, poison gas, to the country which will possibly be her chief opponent, France.

By the conclusion of the non-aggression pact with Poland, Germany has greatly improved her position from the point of view of strategic frontiers. Quantitatively considered, she has increased the 123·3 points of her industry potential by 24·5 points of Poland's, for she

can get food supplies from Poland and the petrol which is of such vital importance in waging war. If Germany can secure the use of Austria's 7.3 points and Hungary's 5 points, she would reach 160.1 points against France's 75.9 and the 99 points of France *plus* her colonies.

In view of the surpassing importance of the war of material, the reckoning of the industrial strength of the lands at war leads to wide and almost certain conclusions. During the world war this was shown by the calculations of Professor Staudinger of Zürich¹ who in the spring of 1917 made a comparison of the fighting capacity of the States at war on the basis of their production of coal and iron by h.p. years (1 kg. of fossil coal = 7,000 calories; 632 calories = 1 h.p. hour; 3,000 hours = 1 h.p. year). He showed that until the entry of America into the war the potential of either side was about the same. When America came in, Germany's potential sank to one-third of that of her opponents. But America needed a year in order to convert war potential into war power. Staudinger therefore prophesied in 1917 that, at the end of that period, Germany must be defeated.

¹ H. Staudinger, "Technik und Krieg" in *Friedenswarte*, Zürich, 1917 (A. H. Fried, publisher).

The nature of the air weapon has further led to future air battles being fought out bloodlessly on paper. If in former times two princes armed against each other, they found out after a while who was stronger by a war. But to-day all ambitious Powers shrink from this test. Contrary to the legend of the battle on the Catalonian Fields, where the bitterness of the slain was so great that their spirits continued fighting afterwards in the air, air fleets to-day struggle in imagination beforehand. Their victories and losses are recorded in the intrigues of diplomacy, the price of armament shares, the spiritual and economic sufferings of the peoples.

The worst effect of the German air weapon is that the countries around Germany will be forced to follow the same road in their home policy, i.e. building up of armaments, general conscription, economic exhaustion, authoritative régimes, unless the approaching catastrophe is averted. For, according to a very simple rule, every military power must strive to be not only as strong as any prospective opponent, but, if possible, twice as strong.

This basic problem, which is of decisive importance, was answered in the House of Commons by Mr. Baldwin as Prime Minister

GERMANY'S AIR FORCE

AIR FORCES OF THE

MINIMUM ESTIMATES COMPLETED FROM

NOTE: Differentiate between First Line or Front Line and Totals	EUROPE	
	Great Britain	France
1919-20: Effective Aeroplanes	14,000 3,300 first line	12,000
1922: First Line	368	928
1931-32: Totals	1,434	2,375
1933: Totals: active, reserve, training, and on stocks	2,400	4,500
Spring 1934: First Line	850	1,650
End 1934: Totals including reserves	1,434	3,000
Spring 1935: First Line	910	1,650
1935-37: established First Line	1,464	3,000
Expenditure: Air Force 1935-36 Estimate	£20,650,000	£22,850,000 (The Times)

THE GERMAN AIR FORCE IN EUROPE 95
SEVEN WORLD POWERS

STATISTICS PUBLISHED BY THE LEAGUE OF NATIONS UNION

EUROPE			AMERICA	ASIA
Germany	Italy	Soviet Russia	U.S.A.	Japan
15,814 destroyed according to Versailles Treaty	?	?	10,000	?
? Civil Aeroplanes	454	?	630	?
Largest Civil Air Fleet in Europe	1,500	750	1,752	1,639
Construction of Goering's secret Military Air Force is started	1,500	2,700	3,058	2,000
May 1st: 1,750-2,100 (secret!)	—	1,300 to 1,500	1,000 to 1,100	?
Secret building in process of development	1,500	1,700	2,351	1,939
1,500 ready for immediate use 2,500 demounted on stocks — 4,000	1,500	1,300 to 1,500	1,100	1,385
Goering demands 8,720	1,640	Minimum 4,000	2,660	2,100
£90,000,000 to £100,000,000	£14,700,000 to nearly £20,000,000 (newspapers)	—	—	—

on February 15, 1927, that is, eight years ago. F. Hudson, M.P., had asked:

"... and whether the Government is prepared, in accordance with the further recommendation of the same Commission [League of Nations Disarmament Commission], to introduce legislation forbidding anyone, civilian or military, to perform exercises in the use of poisons and bacteria?"

Mr. Baldwin:

"Until such time as a definite assurance can be obtained that all Powers are willing to adopt measures of prohibition in regard to poisons and bacteria, His Majesty's Government must take steps to be in a position to defend itself against such attacks. For this purpose research work must be continued. In regard to the second part of the question, as long as our nationals might be exposed to attacks of this nature, it is the bounden duty of His Majesty's Government to take steps to provide protection for them."

Eight years ago, therefore, Mr. Baldwin looked upon the use of bacteria in warfare as being a necessity if an enemy attacked with them.

That is absolutely logical until the root of the evil is dug up.

CHAPTER IV

THE UNSUITABILITY OF THE AIR WEAPON FOR THE DEFENCE OF A COUNTRY

THE present situation in Europe is the result of the world war. After the war the nations saw in the League of Nations a trustworthy guarantee against a repetition of such a catastrophe. But the figures available for war burdens show that, in contrast to this belief, the preparation of national strength in anticipation of the outbreak of a new world war is being more intensively pursued than ever. This fact can only be explained through the effectiveness of the air weapon.

If the decisive position of the air weapon is not radically altered, then all the present measures against war must necessarily remain fruitless, as a simple "balance of power" theory suffices to show. It is hoped that of the three strong air Powers, France, Italy, and Germany, none will venture to attack another for fear of losing the advantage which non-participation in war will secure for the *tertius gaudens*, the rejoicing third party. But it is in the nature of such a situation to be perpetually changing,

and no one ought to reckon with it as with something fixed and permanent.

To-day we find ourselves in such a changing situation on a very large scale and, indeed, at a very critical stage of its development.

If we look at the States of Europe, less from these internal political than from the foreign political points of view, and consider their relative strengths from this angle of vision, we shall have no difficulty in differentiating the aggressive from the saturated States. The aggressive States are Germany, Japan, Italy, and a few smaller States; the saturated States are the two Anglo-Saxon world States (Great Britain and the United States of America), the French group, including the Little Entente, the Soviet Union, the former neutrals, and the Balkan League.

The latter find themselves in a difficulty. Their armament is purely defensive, for they are either saturated or consider that the loss incurred through war is likely to be greater than the gain. But they will not abandon, or will do so only with reluctance, "defence of the territory," as an institution that is the mark of a national sovereign State. Non-aggression pacts of various types have been concluded, but the conclusion is not faced that the collective

security, which alone gives true security, should, at least, be secured in the sense of provision for an effective international control of such armament as is necessary for the protection of the frontier against a raider, and that, further, the internationalization should be carried out of the weapons necessary for war on a large scale and even of civil aviation, because the distinction between a military and a civil aeroplane is practically non-existent. Any civil aeroplane can be transformed into a military aeroplane in less than twenty-four hours. For that reason, after Herr Hitler's peace speech of May 21, 1935, the British Government expressly asked whether he would include civil aviation in an air pact.

The position of the air weapon is thus the one reason. The final reason for the impossibility of defence of the territory against modern weapons of war lies in the change of the relative positions of the man and the machine, in this case, of the soldier and the weapon.

The simple tool may be considered as an instrument over which man, its inventor, has full control. In the case of the modern machine, which is worked not by one man but by a collectivity, the tendency is very plain for the tool to master the maker. This is true, too, of

the modern war machine. More and more does it acquire life of its own, less and less is it a passing phenomenon, a process which can work out only to the disadvantage and perhaps to the destruction of men.

"Defence of the national territory" is generally given as the aim of a war. No minister, no soldier will risk speaking of expansionist aims. Defence of the national territory means protection of the frontiers against an invasion which threatens the life and property of the civil population. The men of military age and strength have to risk their lives to save the civil population, the old men, women, and children. That is what children are taught in every country.

With the introduction of modern weapons of war and particularly of the air weapon, the possibility of defence of the territory in this sense is ruled out and, with it, the aim of war as defined by the politician and the soldier. That definition was already shaken by the use of poison gas, against which there is no longer any military defence, as pacifists and soldiers now alike admit.

From the many testimonies of soldiers, statesmen, and experts on the impossibility of effectively protecting the civilian against the air weapon, let us take only a few.

As early as 1931 the Governments of France, Italy, and Britain asked the International Red Cross to submit a memorandum on the possibility of protecting the civil population against a poison gas attack and the air weapon. Twenty of the foremost experts of all nations, including the former Foreign Minister of Germany, Dr. Simons, and the German General Streccius, unanimously declared in Geneva in December 1931 that "it is useless to try to organize the defence of the civil population against a poison gas war waged with the air weapon, for any protection hitherto discovered is insufficient."

Professor Simons, formerly president of the German Supreme Court, added to his memorandum:

"There is no other method of protection except the proscription, that is, the abolition of war."

Moreover, in the joint work produced under the auspices of the Inter-Parliamentary Union¹ the German Major-General von Haefen, who was one of the experts in the armistice negotiations of 1918, comes to the conclusion that there is no real protection against long-range weapons.

Nearly three years after the Red Cross

¹ *What would be the Character of the Next War?* London, 1931.

memorandum was drawn up, General Poudroux, the head of the Paris Fire Brigade, who in virtue of his office had to organize protection against gas, said in a controversy with the head of the Paris police that:

"Neither dugouts nor gas masks are any protection against the gas war of the future."¹

The former French Minister for Air, Pierre Cot, wrote:

"Every industrial town except some of those in Russia are liable to gas attack, and it is virtually impossible to prevent the attack reaching its goal. A town like Paris could be enveloped in a blanket of poison gas in little over quarter of an hour."²

When in his speech on November 28, 1934, Mr. Churchill estimated the casualty list of a ten days' air attack on London at 30,000 to 40,000, and added that the task of housing and sustaining three to four million fugitives was unexampled, he concluded this part of his speech with the words: "THE FLYING PERIL IS NOT A PERIL FROM WHICH ONE CAN FLY." Mr. Churchill's phrase tersely states the fact that the air weapon renders illusory the defence of

¹ *Œuvre*, August 9, 1934.

² *Ibid.*, November 24, 1934.

national territory, which, by the way, should also be the aim of the League of Nations.

Mr. Churchill's estimate is extremely cautious. According to Hunke,¹ a single air attack on London during the world war resulted in 28,000 cases of nervous collapse and nervous trouble, which took from three to ten weeks to cure.

Why, in face of the fact that all experts admit that there is no protection against air attacks, do all the nations spend large sums for "protection against air attack"? First—as in Germany—in order to mask forbidden manœuvres and to get all civilians to drill as members of the specially created organization for protection against air attack (the German League for Protection against Air Attack—Reichsluftschutzbund), which is a very suitable instrument for air training. Secondly, to lull the civil population into security. This is nearly as senseless as swimming lessons for sailors so that they may save their lives when in mortal danger of shipwreck in a cyclone. There are thoughtful seamen who refuse to learn to swim so that, if the ship does sink in such a storm, death may be swift.

But the real force behind this insane attempt to find protection against air attack is the same

¹ Op. cit., p. 44.

force as lies behind the insane undertaking of war, the force of ~~those~~ interested groups which profit by the effort to find immunity from air attack as they profit by armaments. So long as these groups are not crippled, that is to say, so long as they are not internationally controlled, and their interests are not removed from the sphere of private interest and incorporated in a collective security system, so long will the reports of scientific experts and all the efforts of well-meaning statesmen produce no better results than Don Quixote's onslaught on the windmills.¹

The armaments industry is fond of contemptuously describing such a demand as "Bolshevism." None the less, Woodrow Wilson embodied it in his original draft of the Covenant of the League of Nations, and to-day Viscount Cecil has made himself the mouthpiece of Europe for the demand for internationalization. Neither of them can very well be accused of "Bolshevism."

¹ O. Lehmann-Russbueldt, *Die blutige Internationale der Ruestungsindustrie*. Neubearbeitung 1932, Hamburg, Fackelreiterverlag. Cp. pp. 50-1, "Zu welchem Zwecke treibt man Giftgas—und Luftschutz?"

CHAPTER V

COLLECTIVE SECURITY AS PROTECTION AGAINST THE AIR WEAPON

THE authoritative statement that "we cannot fly the peril of flying" could lead only to black pessimism if Mr. Baldwin himself, in his speech of July 30th, in which he justified the construction of forty-one new air squadrons, had not shown the way of salvation by setting "collective security" even above the forty-one squadrons, and had he not still earlier, on July 19th, expressed the hope that perhaps they would not need to be constructed after all.

The phrase "collective security" brings forward again the principle which France had thought to lay down as early as 1924 in the Geneva protocol. This principle which, immediately after the world war, President Wilson tried to make the basis of his original draft for a League of Nations Covenant, is the principle of an automatic mutual obligation, that is, the principle of the non-neutrality of peace-loving States towards any State convicted of being aggressor.

That this aim has not yet been realized is

due fundamentally to the double character of the settlement of Versailles, St. Germain, and Trianon. This settlement consisted of two parts—an armistice treaty which was imposed on the conquered nations in order to be secure against them for a time, and of the Peace Treaties, including the Covenant of the League of Nations. Though there was no exactitude of definition, the fulfilment of the first part was, in the nature of things, bound up with the fulfilling of the other part, that is to say, the first section of the Peace Treaty dealing with the League of Nations and security, and the thirteenth section dealing with the International Labour Office. Both parts have been attacked by victors and vanquished alike, and treaty revision is demanded. The question of “revising” the Versailles settlement is no longer urgent, for the settlement has, in practical effect, already been “revised” as a result of the German rearmament, on the one hand, and of the repeated application of the still uncodified principle of collective security when a spark threatened to fall into the powder magazine of Europe, on the other.

As one of the first of these situations, let us mention July 1934, when Hitler, relying on England's neutrality, thought that he could

risk the "Putsch" in Austria which he had been planning since the spring of that year. Diplomatic warnings were enough to make him hold back his legionaries who were ready to attack from Bavaria. And any doubt that the world would consider and deal with him as a disturber of European peace was removed when on July 30th Mr. Baldwin said:

"When we think of the defence of England, we no longer think of the chalk cliffs of Dover but of the Rhine. There lie England's frontiers to-day."

On December 9th there was an event of equal significance in Geneva. The assassination of the King of Yugoslavia and the Foreign Minister of France by professional international murderers resulted in a Hungarian-Yugoslav crisis which might have produced the same consequences as the murder of the Austrian heir to the Crown twenty years before if it had not been the policy of England to compel Hungary to yield.

Similarly, the participation of Britain in the temporary garrisoning of the Saar territory placed a formidable obstacle before the steadily increasing desire of Germany to commit aggression.

Thrice within a few months was Europe

brought to the edge of the abyss and was saved from falling into it as a result of her choice of a way which, if firmly followed, is the only way out of chaos.

The danger is not yet conquered. There is still a possibility that Germany will provisionally yield so as to obtain, as an act of grace, the safe landing of her air force in the Geneva haven, i.e. the recognition of its legality by the other Powers. The danger to Europe, Germany's air fleet, cannot be destroyed physically, because to do so would risk the cause of European civilization. There remains, therefore, only the possibility of constructing so strong a "collective security" that no Power in the world, not even Goering's air fleet, would risk making an attack on it. This solution is conditional on all the signatories of the Kellogg Pact participating in the collective security, or they might as well renounce the Pact altogether.

How the plan of collective security is to be worked out has been discussed for a decade. The most suitable proposals are those contained in Lord Davies' book *The Problem of the Twentieth Century*¹ and are as follows:

- "(1) The Executive must in its military capacity (numbers and armaments) be superior to every

¹ Benn, London, 1934.

possible opponent or group of opponents. Certain offensive weapons such as aviation, tanks, motorized heavy artillery, and gas must be forbidden to national armies and reserved to the 'International Executive.'

- "(2) The International Executive is a permanent institution. The supreme command and the general staff will not just be named *ad hoc* when need arises, but will be permanently in function so that the Executive is at any time able to enforce its will by action.
- "(3) The Executive takes action only when there is a breach of law that is international in character; it will not interfere in the internal affairs of a nation such as social struggles or political revolutions.
- "(4) The Executive controls the manufacture of all such weapons as are reserved to it.
- "(5) The costs of the International Executive will be borne by the individual States on a scale hereafter to be determined; any State which does not share in the cost, no longer has the right to demand protection through the Executive."

In this matter of the "Executive" Lord Davies proposes that national formations shall exist side by side with international troops, but he is convinced that after a relatively short transition period the purely international character of the "Executive" will be auto-

matically admitted. The special difficulties with regard to garrisoning do not trouble Lord Davies. In order to assure the independence of the "League of Nations' Army" of the National Governments, he proposes that in the first place the mandated territories of the League should be occupied (Danzig, Palestine), then the neutralized districts (the Rhineland, the Dardanelles, the Turkish islands in the Sea of Marmora and in the Aegean), finally, on the basis of special arrangements with the sovereign States, important strategic points.

To conclude, let me quote two sentences from Lord Davies' book:

- "(1) The International Executive is not there to wage war but to prevent it being waged.
- "(2) International Law will never become effective law if it cannot be enforced if the need arises."

The provision that is missing from these fundamental axioms—the abolition of private profit in the armaments industry—has been brought up by the National Peace Council, referring to the investigations of the Committee of the United States Senate, which revealed the aid to German rearmament given by the American armaments industry. Similarly the French armaments industry, against all common sense,

until recently shared in the delivery of war material to Germany, and the British industry has given Germany's air armaments good help by the delivery of high quality motors. In spite of the repeated demands by patriotic Englishmen that no war material ought to be delivered to a possible enemy, the Government abides by its position that this is a matter for international regulation!

The abolition of private profit in the armaments industry, the international control of production of and trade in arms are, in addition to the internationalization of civil aircraft, the essential conditions of the completion of the work of securing security.

Collective security, which is the only salvation from a European catastrophe in general and from the menace of the German air weapon in particular, must be resolutely based on two fundamental conditions:

"(1) Abolition of all military aeroplanes and internationalization of civil aviation under the control of an international air police.

"(2) Abolition of private profits in armaments and international control of the production of and trade in arms."

CHAPTER VI

THE NEED OF THE HOUR

THE solution sketched in the preceding chapter is the final aim. Its realization may take years. Any day, any hour, the acute situation which will irretrievably lead to chaos may arise from the latent danger. So some provisional solution must be found. It can be found.

The Council of the League of Nations in Geneva and the Court of International Justice at The Hague have failed in their duty. It should have been their task, basing themselves on Art. xiv of the League Covenant, to show proof whether and how far Germany has rearmed and thus not only violated the provisions of the Versailles Treaty but also the obligations which she entered into freely in the Locarno Pact and the Kellogg Pact. The justification for talking of violation lies in the fact of her systematic preparation to wage an offensive war with the air weapon. The preparation of the air weapon in conjunction with that of poison gas rain cannot be justified as preparation of a means of defence. To put a revolver under one's pillow at night may be a defensive act, but

one can hardly call it a necessary preventive measure if deadly poison is put in the soup of someone whose attack is feared. The latter course has no justification in common law; nor has the systematic preparation of poison gas and bacterial warfare any justification in international law.

Irrefutable witness, such as the documents adduced by Mr. Steed, the creation of aerodromes in the demilitarized zone, the creation of offensively trained formations beside the Reichswehr, show that National Socialism is trying not to make Germany capable of self-defence but capable of offensive attack.

The documents that prove the construction of a purely offensive air force which, in the view of students of international law, is equivalent to the aggression made illegal by the Kellogg Pact, are now public property and are therefore the property also of the Hague Court. If it, as a competent body set up for such a purpose by the nations, will not make these documents the basis of a deliberate legal trial in the course of which the statements there given will be proved, then for the moment there is no other way to avert the danger threatening Europe than for the peoples themselves to take the solution in hand.

A body of notable people—of men and women independent of Governments, parties, and interest-groups—to which people of any nation, even Germans, might adhere, ought to take up the Hague Court's task and make objective examination of these accusations which have been published to the world. Its verdict would be the ground for the next step which would save Europe from doom. If the statesmen do not take that step, then all peace-loving men and women in Europe must unite in the cry and the act:

Europe, save thyself!

APPENDIX

AERIAL WARFARE: SECRET GERMAN PLANS¹

By WICKHAM STEED

IN December 1928 a German correspondent whose good faith I had no reason to doubt sent me by post what he believed to be an important secret document. It purported to be a copy of a confidential memorandum which General Groener, the Reichswehr Minister, had addressed in November 1928 to various party leaders upon the necessity of building the first German "Pocket Battleship," or "Armoured Cruiser A." Proof of authenticity was lacking; but internal evidence was so strong that I published a careful English translation of the memorandum in the *Review of Reviews* for January 1929.

No heed was paid to the document in this country. The London correspondent of a Berlin newspaper was the first to understand its importance. He translated it back into German

¹ Reprinted with the kind permission of the Editor from *The Nineteenth Century and After*, July 1934. Extracts from documents printed in italics; interpretations in small type.

and telephoned it to Berlin. Then some of my unfortunate German acquaintances—who were totally innocent—were placed under arrest. General Groener could not deny the authenticity of his memorandum, and spent some unhappy days in trying to justify it. Messages from the Berlin correspondents of English newspapers soon explained the significance of a revelation which had been overlooked by the editorial staffs of those journals in London.

Now, through various non-Jewish German channels, I have received copies of other documents that call for reflection. After studying them carefully with the help of experts, I can find no serious reason to doubt their genuineness; and they bear so directly upon the safety of Great Britain and other countries that they ought not to be withheld from public knowledge. In the main they emanate from what is alleged to be a secret department of the German War Office, or Reichswehrministerium, and consist of communications between it and sundry German undertakings which are interested in the manufacture and development of aircraft and in methods of aerial warfare.

This secret department is called the L.G.A.—an abbreviation of “Luft-Gas-Angriff,” or “Air Gas Attack.” There is also a department called

L.G.V.—that is, “Luft-Gas-Verteidigung,” or “Air Gas Defence.” But my information concerns chiefly the L.G.A.

The first document, which, though written on plain paper, bears official reference numbers and is dated from Berlin at the end of July 1932, is marked “strictly secret,” and is signed with an illegible name above the words “Colonel and Chief of the Department L.G.A.” It is a communication to an aeroplane firm and runs:

As you were informed some time ago, the gigantic French fortifications on our Western frontier made attack by infantry seem quite, and artillery attack almost, hopeless. Consequently there remains only the most intensive development and extension of the air weapon, in order that air warfare may be waged effectively and ruthlessly against important military and industrial centres and, above all, also against the civilian population of large cities.

Therefore the L.G.A. applied on June 22, 1922, to No. IX (the number known to you from the list sent to you on June 2, 1932, of the collaborators and experts of the L.G.A.) and asked him for proposals or a memorandum setting forth how, in his opinion, attacks by air might in future be most effectively carried out.

Enclosed in photographic copy are extracts from his memorandum, received to-day, upon which you will please comment as quickly as possible.

The style of this document is not especially military—a circumstance which, did it stand alone, might be held to warrant suspicion. But the sequel tends to dispel doubt. The first page of the photographed extracts from No. IX's memorandum begins with an incomplete passage of which the full meaning is not quite clear, since its opening words were apparently on the previous page that was not transmitted. The remainder of the passage runs:

in the necessary provision of raw materials by a simple transformation of the proper departments of large chemical undertakings, so as to produce Yellow Cross or compressed Yellow Cross, could easily be assured.

("Yellow Cross" is currently, though inaccurately, called mustard "gas," for "Yellow Cross" is a liquid. Other German names for it are "Senfgas," "Lost," and "Yperit.")

Then follows the third section of No. IX's memorandum:

(b) PHYSICAL OBSERVATIONS

The following procedure is proposed in order to test, in scientifically unexceptionable fashion, the conditions of raining down liquids containing chemicals or bacteria, as is desired by the L.G.A. and L.G.V. This procedure has the advantage of being extremely simple and cheap and at the same time being practicable on the largest scale without enabling our civilian population or the secret agents of other Governments to notice anything. The idea came to me after recent conversations with No. V at Cologne.

It is known that bacteriologists use the Micrococcus prodigiosus, which is called the bacillus of the "Bleeding Wafer" by reason of its red colouring, to demonstrate to students of tuberculosis or similar maladies the danger of infection by tiny drops of saliva.

In these demonstrative experiments one simply mixes with saliva in the mouth small quantities of a—for human beings quite harmless—pure culture (of this bacillus), and gives one's lecture at various distances from sterilized culture plates. At the end of the lecture the plates are covered up and the germs are bred so that they may be shown to the students. From the number of the germ colonies that are found, conclusions can be

drawn as to the quantity, range, and trajectory of the little drops of saliva.

Since the Micrococcus prodigiosus is very rarely found in the air—according to the report of No. V it hardly exists in the air, at least not under normal conditions—this fact would be very suitable for a test of the extremely complicated aero-dynamic effects to which—according to preliminary measurements undertaken by Nos. III, VII, and the undersigned—the raining down of liquids from aircraft at various heights is exposed. It is obvious how enormously important it is to clear up these questions in view of an effectively concentrated bacteriological or chemical attack by air.

If these bacilli could be successfully rained down from an aeroplane, with sufficient concentration, from various heights and in varying conditions of wind and weather, etc., and, as in the case of the medical demonstrative experiments just mentioned, could be caught by culture plates on the ground, then one could study at one stroke,¹ aero-dynamically and meteorologically, not only bacteriological but also chemical spraying.

The undersigned is not enough of a bacteriologist to be able to decide upon the suitability of the Micrococcus prodigiosus for these purposes. But

¹ Italics in the original.

he urges the staff of the L.G.A. to have this examined as soon as possible by a competent scientific collaborator, since, as has just been said, the wholly obscure questions of physics in relation to small drops might be solved to the greatest advantage of the L.G.A., and perhaps in a very simple way, by the "bacteriological" procedure which the undersigned has planned.

The next extract also begins with an incomplete sentence:

"bring home to the Reichswehrministerium the reasons for our very notable superiority in comparison with the English and French technique of discharge (from aircraft)" (Abwurftechnik).

The extract continues:

(c) *MILITARILY IMPORTANT AERO-DYNAMIC INVESTIGATIONS IN ENEMY COUNTRIES (beim Feinde)*

In the paragraphs IVc and d (which are not among the extracts from No. IX's memorandum that have reached me) mention was made of the especial and, for us in the event of an enemy attack, decidedly more favourable conditions of the air currents in the Berlin and Hamburg under-

ground railways, in relation to which a number of very important principles were discovered.

Quite as important, nay, much more important, would it be to investigate the conditions of air circulation in the Paris Metro and in the various London [underground railway] systems according to the Berlin scale of measurements. Our knowledge of these conditions is still thoroughly inadequate.

The material upon measurements taken by secret agents and sent to the undersigned by the L.G.A. (reference Nos. Ic.1399/31; Ic.2144/31; Ib.1729/31 and Ic.88/32; Ib.135/32; Ic.438/32; 793/32; Ic.1207/32 from Paris; as well as Ic.1417/31; Ib.1332/31 and Ic.81/32; Ib.125/32; Ic.511/32; Ic.1301-07/32 from London) is still much too fragmentary and in part also lacking in objective¹ exactness, as appears from the diagrammatic valuation. Therefore it is urgently necessary¹ that the measuring instruments should be made more delicate and be simplified for agents in the way recently indicated (at the discussion in the Reichswehrministerium on June 16, 1932). This could best be done direct¹ through Darmstadt, Dessau, and Göttingen.

Nevertheless the undersigned is able to see from the figures before him that the L.G.A. scheme for

¹ Italics in the original.

the infection of large cities like Paris or London by distributing separate deposits of Yellow Cross [mustard gas] or bacilli in the systems of their underground railways ought, in the main, to be practicable. The ascertained, though doubtless abnormal, effects of the indraught of air at the entrances to many underground stations and stopping-places are also very interesting (compare the measurements at the Pasteur, Montparnasse, and, above all, Concorde stations in Paris, or in London at Leicester Square, Tottenham Court Road, and especially Piccadilly Circus and Liverpool Street). These effects would greatly assist gas attacks by airmen upon these points, since spaces like the Place de la Concorde or Piccadilly Circus offer a typical picture from the air and are therefore very easy for an observer to spot.

The undersigned believes, therefore, that the bacteriological procedure indicated above would be of great utility in the preliminary aero-dynamic studies that are still necessary for the chemical or bacteriological infection of enemy underground railway systems.

The recipients of these two communications from the L.G.A. acknowledged and answered them only towards the middle of August 1932. They gave various reasons for the delay, one

of them being that the very great importance of the questions raised in the memorandum written by No. IX required a plenary sitting of all competent persons, some of whom were absent. They found No. IX's proposals "*very good*" and raised no objection to an experimental "*raining*" from the standpoint of technical aviation, since their aircraft, built mainly of duralium, were not susceptible to chemical influences. If desired, their aircraft could be specially varnished with bakelite, though this seemed hardly necessary. They thought the proposed method of testing the effects of raining down bacilli "*highly significant both theoretically and practically,*" and urged that the needful bacteriological technique should be worked out. They enclosed diagrams of air currents, including some drawn up by the institute at Göttingen for various types of aircraft.

The next stage in the proceedings consists of a lengthy correspondence with the German War Office and the L.G.A. upon the results of experiments with a liquid culture of *Micrococcus prodigiosus* sent from Berlin in 60-litre carboys. At first these experiments failed. No colonies of bacilli grew upon the culture plates, in the preparation of which agar, a gelatinous Japanese seaweed, was used. But on January 27, 1933,

the L.G.A. was delighted to find that various culture plates used in a laboratory experiment "*plainly showed colonies of the Bacillus prodigiosus after being kept thirty-six hours in a temperature of 25 degrees Centigrade.*"

This was three days before the appointment of Herr Hitler to the German Chancellorship and the formation of his Administration. The dates of the previous correspondence, and the reference numbers mentioned by No. IX in his memorandum, prove that the L.G.A. asked for No. IX's expert opinion during the von Papen Administration, and that air measurements in the Paris and London underground systems had already been made in 1931 during the Bruening Administration. But on February 3, 1933, the L.G.A. was requested by the firm which had been entrusted with the experiments to inform it of the composition of the liquid culture of *Bacillus prodigiosus* so that laboratory tests and experiments by aircraft could be more rapidly carried out. "*In the interest of national defence,*" the chief of the L.G.A. firmly declined this request on February 10th. But before the end of February 1933, as a result of personal representations made in Berlin, the matter was laid before Herr Hitler himself and submitted to his decision. The chief of the L.G.A. could

not foresee, "*in view of the strained political situation,*" what the decision would be or when it would be taken.

As a matter of fact, Herr Hitler gave his decision (in the affirmative) only on May 16, 1933—that is, on the eve of his famous Peace Speech in the Reichstag. When informing the experimenting firm of this decision, and enclosing the chemical formula for the composition of the liquid, the chief of the L.G.A. wrote:

Berlin, May 17, 1933.

In accordance with the decision signed by the Chancellor on May 16, 1933, which lies before us, your request of February 3, 1933, is hereby granted and the order of February 10, 1933 (reference No. IIc. 74/33), is revoked.

The composition of the solution, which you are hereby bound to keep strictly secret,¹ you will see from the enclosure. It is, besides, especially necessary to note that you may neither make the culture plates yourselves nor breed [the germs] upon them, since this might easily attract the notice of the academically educated members of your staff.

The chemical formula itself seems compara-

¹ Italics in the original.

tively simple, and it may appear strange that so much care should have been taken to keep it secret, inasmuch as it is a very slight modification of formulas already known and published abroad as well as in Germany. Expert chemists assure me, however, that the modification is not quite so simple as it looks, and that many things look simple when once they have been discovered.

As long ago as 1899, an article by Edwin O. Jordan in No. 27 of the *Chicago Botanical Gazette* on "The Production of Fluorescent Pigment by Bacteria" points to the value of various chemicals in developing this pigment; and volume 73 of the German *Archiv für Hygiene*, published in 1911, contains a report upon cultures of the *Micrococcus prodigiosus*. The report points out that this germ, when bred on slices of potato, regularly forms trimethylamine. The authors of the report, D. Ackermann and H. Schütze, suggested a composition in which 20 grammes of agar should be used. But, as the use of agar would have yielded a gelatinous liquid, the author of the L.G.A. formula substituted ingredients more suitable for the purpose in view. The obvious reason for the secrecy is that the L.G.A. was actuated by a comprehensible desire to prevent

any hint of its schemes from reaching the uninitiated in Germany or elsewhere.

Soon after the experimenting firm had been informed of the chemical formula, a series of tests began. A civilian chemist, sent from Berlin, scraped, with a sterilized platinum blade, pure cultures of *Micrococcus prodigiosus* off potato slices and mixed these pure cultures with the chemical solution until it took on a rosy hue. Then he went back to Berlin, taking with him samples of the mixture so that the number of germs in each cubic centimetre might be accurately ascertained. Three days later he returned, and the mixture was rained down from an aeroplane flying at various heights between 5,000 and 1,000 metres, culture plates having been placed in suitable positions upon the flying field below. The culture plates were then taken to Berlin so that the results of the experiments might be secretly and exactly discovered.

The results appear to have been satisfactory. Before the end of July 1933 the chief of the L.G.A. in Berlin wrote urgently to the firm in question, enclosing a photographic copy of an extract from a further memorandum from No. IX and asking the firm to express its opinions upon sundry technical points. One of these

points was whether anybody had yet succeeded in calculating mathematically the initial velocity (of liquids) discharged from tubes of more than 1 centimetre diameter, or whether one of the firm's physicists had found, empirically, a workable formula. A very speedy answer was asked for, because thorough experiments on a large scale were contemplated in the course of August 1933.

The extract from No. IX's second memorandum consists of a long disquisition upon the velocity of drops of liquid falling through the air, together with a number of mathematical calculations and comparisons. But the beginning of the extract runs: "*As regards the experiments with the bacilli, the undersigned is glad to know that, in accordance with his advice, two experiments have already been made and have given encouraging results.*" It seems, therefore, that the culture plates on the ground had caught enough of the bacilli rained down from the air to prove the procedure recommended by No. IX to be practicable.

It appears, further, that No. IX and the other scientific collaborators of the "Air Gas Attack" Department of the German War Office had been studying the works of foreign meteorological authorities and had confirmed the well-known

conclusion that drops of liquid cannot exceed a certain diameter and that the Stokes formula only applies to drops of small size. But, as No. IX remarks, drops of this size are not desirable, for tactical reasons, in raining down Yellow Cross (mustard gas) liquid, because such small drops, as in the case of fog, fall very slowly. According to measurements taken by No. IX and his collaborators, small drops of distilled water fell through the air only at a speed of 0.097 centimetre per second, whereas larger drops fell 585.4 centimetres in a second. The slow falling of the smallest drops would be tactically very disadvantageous. In sunshine they would evaporate rapidly before reaching the earth. The wind could easily blow them away from the spots aimed at, or a current of warm air could carry them up to great heights. This would enable the enemy, or a civilian population, calmly to reach places of safety. Therefore No. IX strongly favoured drops of such a size as to fall with a maximum terminal velocity. As to the time taken by liquids of various specific gravities to run out of tubes of from 5 to 20 millimetres diameter, No. IX observes that in this case the Toricelli law is valid, though only when tubes of 1 centimetre diameter at most are used, and on condition

that the internal diameter of the tube is constant, and that the direction of the liquid stream is not changed by more than one bend in the tube. When the diameter is larger than 1 centimetre various factors combine to deform the stream and to make all calculation uncertain.

Coming then to experience gained by Germany in bomb-dropping during the war, No. IX suggests that bombs containing about 100 kilogrammes of Yellow Cross (mustard gas) liquid might be used. As this liquid, technically pure, has a specific gravity of 1.26 at a temperature of 20 degrees Centigrade, 100 kilogrammes of it would fill roughly the space of 79.5 litres. To this quantity about $2\frac{1}{2}$ litres of inert gas must be added so as to increase the constancy of the Yellow Cross liquid. Therefore the diameter of the bomb must be such as to allow for a volume of 82 litres in a cylinder 2 metres high.

This calculation gives a diameter of 11.4 centimetres. For reasons of safety the glass of the container ought to be at least 0.4 centimetre thick, for the thickness of only 0.25 centimetre, suggested by the L.G.A., might be dangerously thin. Thus the tare of the glass container, taking into account the difference of volume between two cylinders of 11.8 and 11.4 centi-

metres diameter, with a height of 2 metres, works out at about 15.4 kilogrammes. The emptying of a Yellow Cross bomb by raining down its contents would take about ten minutes through a round tube—that is to say, 132.5 cubic centimetres a second; but if other factors were taken into account it might be as much as 221 cubic centimetres a second.

No. IX's calculations were checked and tested by the research department of the firm in question, and, early in August 1933, were found to be accurate and in accordance with the observations of Lenard, the famous German physicist, upon rain-drops. But, as regards the Toricelli law for tubes larger than 1 centimetre, experiments with water and benzine showed that this law has its limitations, and is totally inapplicable to tubes of more than 8 centimetres diameter. Mathematical treatment of the problem of discharging liquids through large tubes seemed almost hopeless, because the stream of liquid is narrowed by a number of factors and leads to irrational conclusions, as the Russian physicist Professor Chwolson, has already pointed out. In any case, it would be far too dangerous to use any form of tank or reservoir for the liquid gas because of the stationary-wave effect that would be set up in a tank by atmospheric pressure

and by the vibration of the motor and propeller. Further experiments were then undertaken to decide the best form of apparatus for the discharge either of pure Yellow Cross liquid or of bacteriological cultures. Once more, No. IX produced suggestions comparable to the egg of Columbus. *"In technical matters one is often led, or forced, to follow very complicated paths, only to find one day a surprisingly simple solution of a problem."*

These new proposals described apparatus for the discharge of Yellow Cross liquid from "*glass bombs*" in aeroplanes, so that a bomb containing a unit of 79.5 kilogrammes of Yellow Cross (mustard gas) liquid could be emptied in ten minutes with or without pressure upon the contents. No. IX lays down the further principle that his apparatus must be adaptable to every type of aeroplane, that there must be an emergency device to permit the whole bomb of Yellow Cross liquid to be dropped in case of need or in order to cover especially important points with great quantities of "*Haber's coefficient of deadliness*" (Tödlichkeitsprodukt), and, by a high degree of concentration, to multiply its effects. It seems that the largest drops of Yellow Cross liquid—of which the specific gravity is higher than that of water—

would fall to the ground at a speed of 8.4 metres a second. In favourable meteorological conditions such drops could reach the earth in eight minutes from 4,000 metres, in six minutes from 3,000 metres, in four minutes from 2,000 metres, and in two minutes from 1,000 metres.

Soon afterwards, in October 1933, the L.G.A. drew up a list of plans for gas attacks upon a large number of towns and places in France. They included Diedenhofen (Thionville), Metz, Strasbourg, Mutzig, Belfort, Nancy, Briey, Verdun, Toul, Epinal, the inner city and the suburbs of Paris, Toulon, Marseilles, Lyons, Havre, Rouen, Caen, Nantes, Le Creuzot, St. Étienne, Roubaix, and Tourcoing, besides eleven places in the Nord department and nine in the department of Meurthe and Moselle. The object of communicating these plans to the experimenting firm appears from a letter written by the chief of the L.G.A. towards the end of October 1933, in which the firm is requested to check the plans in relation to the prevailing air currents which had been theoretically assumed to be probable. The firm was asked to mark in red ink eventual errors in each "*gassing plan*."

Of even greater interest than these projects is a document which, at first sight, appeared

incomprehensible. A double sheet of about foolscap size bore a series of numbered entries, the text being written, or rather scribbled, hastily in pencil. The paper showed clear marks of finger prints. The entries seem to have been made in the open air and the paper itself to have been laid or to have fallen on the ground, for it is distinctly dirty. It bears no date or signature, but, from internal evidence, was begun on August 18, 1933. Across the top left corner run the words—in the same handwriting as the text and underlined in red—“*Please examine carefully and check by diagram.*” There seemed little hope of making out what this document meant, for it consists entirely of German abbreviations and of figures. The opening lines may be given as a specimen:

“O. P. f. Vers. u. Koor. Conc. (ob.).—Mehrf. umf.
—ca. 210×10^{12} —. Be. m. H. Pers; gen. 6 h sp.
Strg.—2.47 p.m.—18.8.33.
Nr. 1: Pl. Rpq: ONOO; 3, 12 km: B 1-2;
A. 8,75; nor. neg.; s.g.ggt. K 4231.”

By careful expert study, with the help of a map of Paris, nearly all of the abbreviations and figures could nevertheless be made out. Not only does the deciphered text show how thoroughly the plans for air attack with bacterio-

logical solutions or gas, or both, have been tested by German agents in Paris (and probably elsewhere), but it proves that the author of the document must have been acquainted with the proposals and calculations supplied by No. IX.

Though I cannot claim that the interpretation of this cryptic document is exact in every particular, or that closer study by meteorological or other experts would not show some of the renderings to be doubtful, I may give an instance of the care with which it has been examined. The most comprehensible details of the first two lines are "6 h" and "2.47 p.m.-18.8.33." If "6 h" be taken to mean "six hours," why should a German agent have used the letter "h" instead of "St.," an abbreviation of the word "*Stunden*," or "hours"; and why should he have written "2.47 p.m." instead of "2.47 N," an abbreviation of the German word "*Nachmittag*," or "afternoon"? The answer is that it is the established practice of German, as of other meteorologists and astronomers, to use Latin abbreviations in recording the times of observations, and that "h" stands for "hora" and "p.m." for "post meridiem."

Some knowledge of meteorology is, indeed, needed to comprehend the cryptic document, though its broad sense can be readily under-

stood with reference to the Paris underground railway system, commonly called the "*Métro*." German agents took the Place de la Concorde as the central point of their operations and used the obelisk in the middle of it as their main point of co-ordination. At the north-east corner of the Place de la Concorde, where the Rue de Rivoli begins, there is an underground station from which lines run in several directions, one of them going north and east towards the Place de la République, another south-west in the direction of the Ecole Militaire, and another due south under the Seine to the Chamber of Deputies station on the left bank, near the end of the Boulevard St. Germain. The object of the experiments was to find out how many "colonies" of *Micrococcus prodigiosus* would grow upon culture plates exposed to air samples from or near various underground stations, after the Place de la Concorde, and apparently other places, had been sprayed with large numbers of these germs, and the germs themselves had been carried by the wind to the openings of the underground stations or sucked in by ventilators.

The interpretation of the two first lines of the report is as follows:

"The Place de la Concorde is the zero point for tests and co-ordination of all measurements, the obelisk

being the centre of the co-ordination point. The Place de la Concorde was driven round (*mehrfach umfahren*) several times, about 210 units, containing a billion (*Micrococcus prodigiosus*) germs each, were sprayed. Done with the help of assistants; and, exactly six hours later, the results were measured. The spraying itself took place at 2.47 p.m. on August 18, 1933."

Entry No. 1 deals with the results at the Place de la République station, 3.12 kilometres east-north-east of the obelisk on the Place de la Concorde. The measurements refer to the Beaufort scale of wind force (on which a report was issued by the Director of the British Meteorological Office as an official paper, No. 180, London, 1906). Anemograph readings of wind velocity were also taken. The term "*negative*" is used to mean the direction of a wind blowing towards the point of co-ordination, and "*positive*" to mean a wind blowing away from the obelisk. Thus interpreted, entry No. 1 runs:

"Result of the measurements at the Place de la République station in a direction east-north-east from the obelisk which is 3.12 kilometres distant. Wind, according to the Beaufort scale, 1—2, or an exact anemograph reading of 8.75 kilometres an hour. In normal conditions of wind and with a wind blowing

towards the point of co-ordination, conditions are very suitable, since 4,231 colonies were counted on the plates."

The second entry refers to results at the Ecole Militaire station near the corner of the Avenue de Suffren and the Avenue de la Motte-Picquet. Its interpretation runs:

"The point of measurement is the Ecole Militaire, especially at the junction of the Avenue Suffren and the Avenue de la Motte-Picquet, 2.2 kilometres south-west of the obelisk. Strength of the wind 2, according to the Beaufort scale, 12.33 kilometres an hour as shown by anemograph. This position is only relatively suitable. Merely 313 colonies grew. The dissemination [of the germs] by air currents is feeble on account of the [open space of the] Champ de Mars. The wind was clearly positive, that is to say, was blowing away from the obelisk."

According to entry No. 3, the experiment near the underground station Porte Charenton was still less satisfactory. The agents may have been disturbed in their work or other circumstances may have been unfavourable. The interpretation runs:

"Measurement at the underground station Porte Charenton. Result at a point opposite the Bois de

Vincennes. South-easterly direction from the obelisk and 6.75 kilometres distant from it. Strength of wind, according to the Beaufort scale, 0—1. Anemograph 3.33 kilometres an hour. Wind conditions normal. Four series of three plates each were used. Wind blowing away from obelisk. Result bad, the exposure was too short. Few or no colonies were found on the plates.”

The fourth entry is likewise unsatisfactory because the work of measurement was disturbed. It refers to a run in a motor car from the underground station Solférino along the left bank of the Seine as far as the Place Valhubert. It says:

“Drove in a car from the underground station Solférino along the Quai d’Orsay on the left bank of the Seine by way of the Quai Voltaire, Quai Malaquais and Quai St. Bernard. Stopped at the Place Valhubert and carried out a measurement at a spot almost opposite the Gare d’Orléans 3.9 kilometres in a bee line from the obelisk. The measurement was disturbed, but the air suction was enormous.”

The fifth experiment took place in the Allée de Longchamp and yielded poor results. The spot chosen was 300 metres from the Porte Maillot station, west-north-west from the obelisk. The measurements were uncertain. Only 658 colonies were counted (on the culture plates).

Nevertheless, this point was thought "*perhaps suitable*."

The sixth entry shows more encouraging results. This experiment was undertaken near the underground station Porte de Versailles, with reference also to the underground station on the Boulevard Pasteur, usually called "*Pasteur*." The interpretation runs:

"Point of measurement underground station Porte de Versailles, 7 p.m. Distance exactly 2.11 kilometres (perhaps by underground from the Pasteur station, which, in this experiment, served as a secondary point of co-ordination). Porte de Versailles very important because it is a terminus and leads to Pasteur. Wind conditions normal blowing towards obelisk. Very good result!!! 6,738 colonies obtained."

In entry No. 7 the Pasteur station was (as in No. 6) a subsidiary point of co-ordination. It runs:

"Another measurement in which Pasteur was again taken as point of co-ordination. Here the suction of the air was very strong. At the entrance the air was warm, and a wave of pressure was observed. The results of the measurements are marked on a special map. Wind conditions normal, blowing towards the obelisk from a south-westerly direction. The distance from the obelisk is shown on special map; 95,778 colonies were

counted!!! The result was checked an hour later, and 91,389 colonies were counted."

The delight of the agent at the result of this experiment was such that he put three notes of exclamation after the number of germ colonies counted, and checked the result again an hour later.

Still better were the results of test No. 8 at the Chamber of Deputies station, 500 metres from the obelisk on the Place de la Concorde. This entry runs:

"Point of measurement Chamber of Deputies station, 500 metres south of obelisk. Measurement inside the station. A flat wave of air pressure was observed. Opposite the entry is a very suitable place. Four series of three samples each, with a warm current of air, normal pressure, direction of wind towards the obelisk. 1,124,781 colonies grew because the point is so near to the obelisk. IX. is right!!! Strength of wind was 1—2, according to Beaufort scale, and 9.69 kilometres an hour on anemograph. This inside result is annihilating!! Note particularly and repeat measurement."

The remainder of the document refers to further measurements taken on September 19, 1933, with reference to telegrams (? sent to Berlin) on July 14, August 4, and August 12.

These measurements took place near the forts on the north, east, and west of Paris, particularly at Corneilles, Montmorency, Domont, Ecouen-Stains, Garges, Vaujours, Paliseau, and St. Cyr. The measurements in the south of Paris were to be taken subsequently.

Simultaneously with these measurements in Paris, experiments on a large scale were carried out in Berlin, apparently under the auspices of the L.G.A. itself. The results were submitted to the firm which had undertaken the original experiments with the *Micrococcus prodigiosus*, and it was asked by the L.G.A. to send in its comment with all speed, "*since weighty comparisons are to be made with the material on observations received from Paris and London.*" It was suggested that the comment upon the Berlin results should be made personally in Berlin, and that special arrangements would be expedient for the protection of the person making them because the Secret State Police had recently noticed very lively activity among the secret agents of other Great Powers.

The centre of the Berlin experiments was the Tempelhof field. They were made towards the middle of August 1933, in the small hours of the morning. The Friedrichstrasse railway station was the central point of co-ordination.

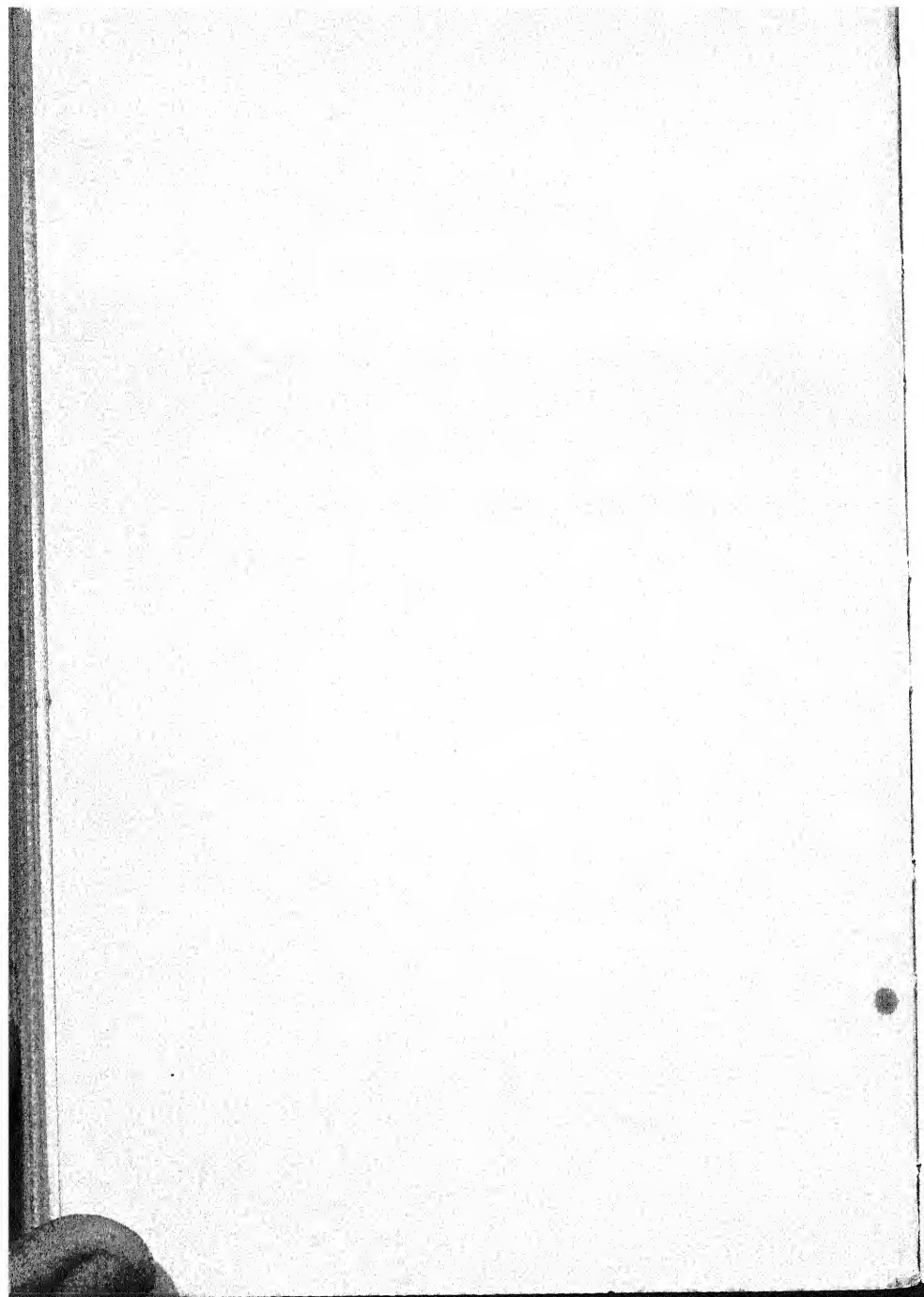
Subsidiary points were the flying fields at Johannisthal, Spandau, and Staaken, besides a number of other centres, some of which were as far as 50 or 60 kilometres from Berlin. Upon the results of the Berlin experiments no figures or other indications are given.

CONCLUSION

From the facts which these German documents reveal, the conclusion seems warranted that the Air Gas Attack Department of the German War Office has been conducting experiments and measurements in Paris and London since 1931 for the purpose of ascertaining how the underground railway systems can best be infected with deadly germs or poison gas, or with both, whenever attack is thought expedient. The experiments in Berlin were doubtless intended to be at once a means of checking the results obtained in Paris and London and of making defensive arrangements in case of aerial attack upon Berlin.

In connection with these bacteriological experiments it is a noteworthy coincidence that, very soon after the L.G.A. had received No. IX's first memorandum, at the end of July 1932, a writer in the *Militärwochenblatt* (the organ of

the German General Staff) proclaimed (on August 18, 1932) the need for a new strategy of surprise which would be "so crushing that the enemy will find it materially impossible to organize his defence."



EXPLANATIONS

WHEN one thinks of the magnitude of the charge against the Reichswehr which Mr. Steed's documents constitute, it is not surprising that a whole crop of denials followed their publication. The official *démenti* of the German Government published by Reuters merely denied all the information contained in Mr. Steed's article, and it was simply asserted that the secret documents which Mr. Steed said were in the Ministry of Defence (Reichswehrministerium) did not exist. That was the only attempt made at exculpation.

Then Dr. Goebbels's Propaganda Ministry took action. A completely unknown authority who is not a specialist, a certain National Socialist journalist from Hamburg, Herr Ernst Burckhardt, was produced, and he published a series of no fewer than nine articles in the *Hamburger Tageblatt* and the *Cuxhavener Tageblatt* to demonstrate that Mr. Steed had been victimized by forgers. That was clear, he maintained, simply from the technical point of view.

In the September 1934 number of the *Nineteenth Century* Mr. Steed answered this

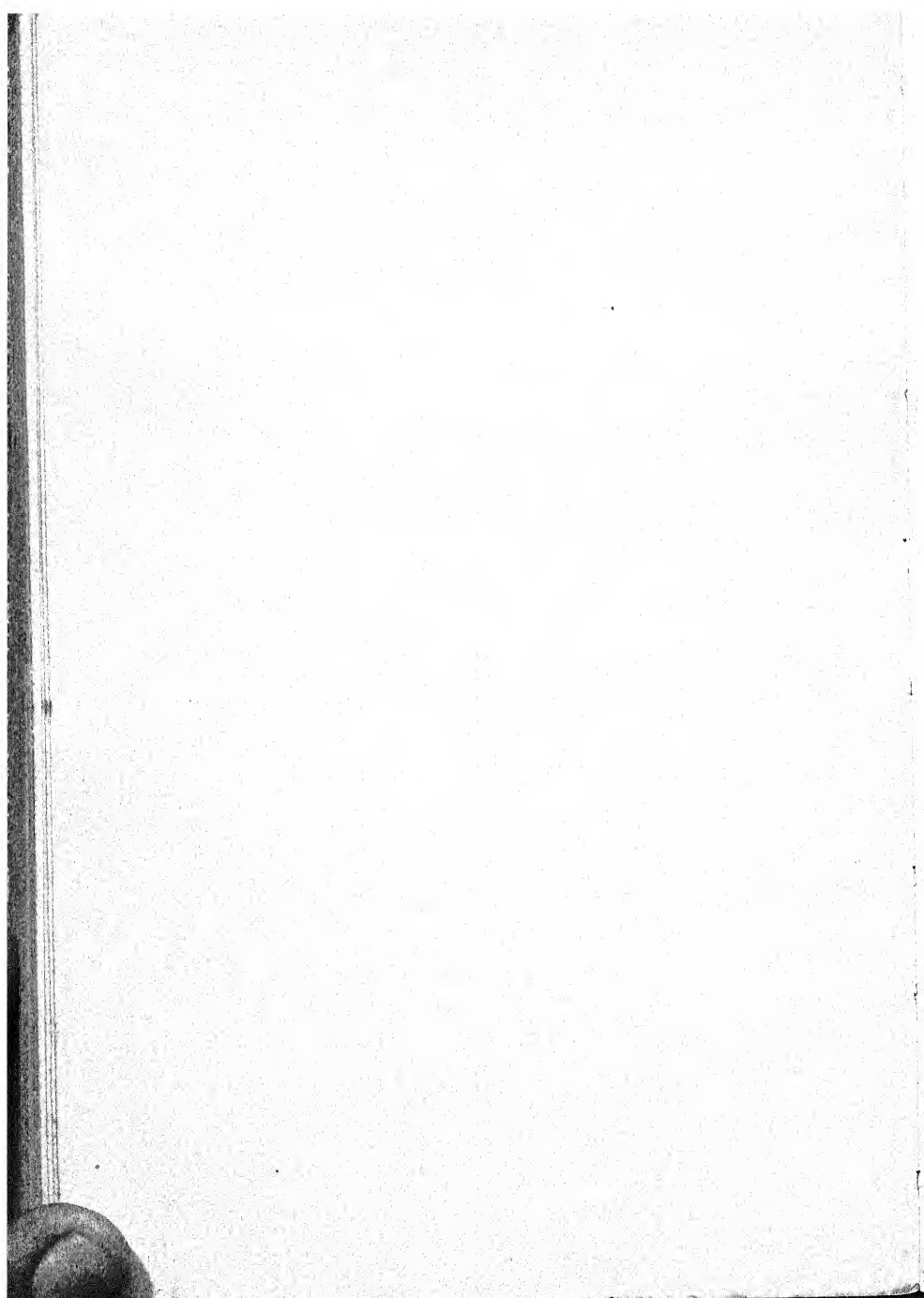
non-expert, and proved the complete impossibility of accepting Herr Burckhardt's views from the technical literature on bacteria written by experts. This reply should be closely studied.

Meantime Mr. Steed in the August number of the same review had shown a very interesting connection between his documents and certain patents (and other documents) taken out by the German poison gas manufacturer, Dr. Hugo Stoltzenberg of Hamburg. He was able particularly to show that some "agricultural" patents were actually war patents and were intimately related to the military technical publications of Stoltzenberg's in his book *Die Ultragifte*.

Then there came forward in the British *Army, Navy, and Air Force Gazette* a German officer, Herr K. H. Abshagen, who was described as a "German of established authority." That he could not possibly be of "established authority" was clear from the German Imperial Navy List, according to which he was an active officer in the 2nd Marine Battalion in Wilhelmshaven and was seconded to the Marine Corps. His strongest argument against Mr. Steed was that the "forger" of the documents could not even have been a German, because the word *Tödlichkeitsprodukt* which appears in Mr.

Steed's documents is "an absolutely ridiculous word." But in his answer in the August 2nd number of the same periodical, Mr. Steed made Herr Abshagen ridiculous by showing that in a standard German work on war-gas chemistry the word appears five times on one page.

Some time later a British major most surprisingly came forward to argue that the technical theory underlying Mr. Steed's documents was proof of a deliberate attempt to take Mr. Steed in. Major Paul Murphy, who was formerly director of experiments at the Experimental Chemical Defence Station at Porton, proved this point to his own satisfaction by asserting that it was impossible to solve a chemical problem by a bacteriological method. But as Mr. Steed showed, in his reply on September 13th, the perfectly harmless red-pigmented *Micrococcus prodigiosus* was used only to obtain information as to the action of air currents so as to judge the possibility of using Yellow Cross (which is sprayed) or epidemic-creating bacteriological cultures. Thus the documents which Mr. Steed revealed in *The Nineteenth Century and After* successfully withstood the criticisms directed against them.



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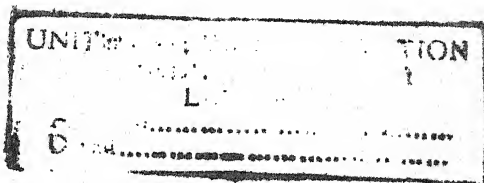
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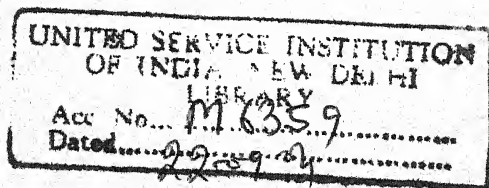
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Title Germany's Air Force

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